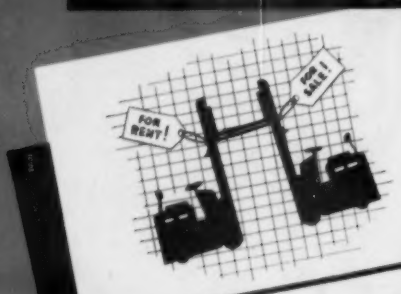
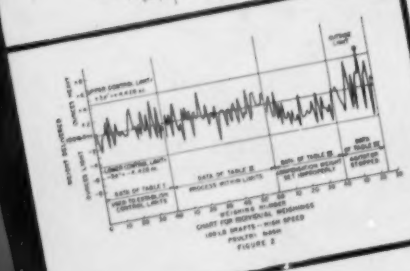
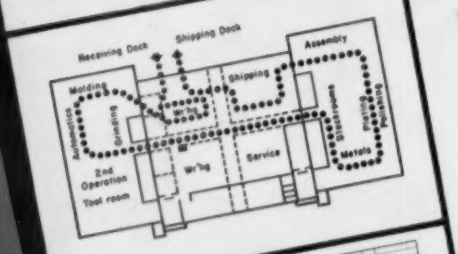
MATERIAL HANDLING FLOW

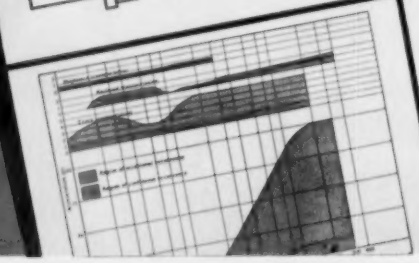
MARCH 1955

HANDLING • AUTOMATION • PACKAGING AND SHIPPING









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FLOW Magazine
1240 Ontario Street
Cleveland 13, Ohio

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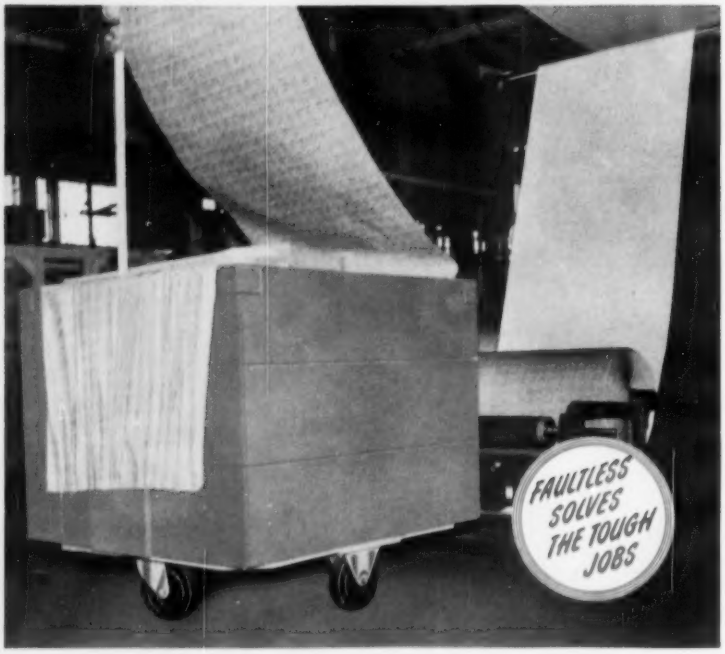
Accepted as controlled circulation publication at Penton, Ill.

STEVENS RICE
UNIVERSITY MICROFILMS
313 N FIRST ST
ANN ARBOR MICH

NOELTING **Faultless** **CASTER MATERIALS HANDLING FACTS**

No. 9 in a series of Caster Achievements for men in industry

THE CRANSTON PRINT WORKS, WEBSTER, MASS., USES FAULTLESS CASTERS FOR MORE ECONOMICAL FLOW OF PRINTED FABRICS



Standardization of materials handling equipment methods has resulted in the establishment of an economical, simple procedure of product flow in the Cranston Print Works at Webster, Mass. Faultless Caster equipped cloth box trucks are used at each stage of the Cranston production process—from the time the cloth is first printed until the cloth is "finished." In most cases the cloth is "lapped" (folded) into the truck as it comes off the machines. In this manner large quantities of cloth in process can be handled with a minimum of space and effort.

200 SERIES WITH DOUBLE BALL BEARING SWIVEL

Heavy pressed steel frame and King-pin assembly has made it famous for heavy duty work. Large size balls distribute the load around an unusually large raceway. All bearing surfaces are hardened.

2700 SERIES

The 2700 Series is the Rigid Companion to the 200 Series. Designed and built for solid rigidity. Deeply embossed and drawn from heavy gauge steel. It is solidly formed to withstand strain and wear.

Cranston engineers selected Faultless 200 Series Swivel and 2700 Series Rigid, and Faultless 900 Series Swivel and 9700 Series Rigid casters for all their trucks. Eight inch diameter, Ruberex, cushion-tread, wheels were chosen for use on the smooth concrete floors of the Massachusetts plant. Both the double ball bearing swivel plate and the rigid casters utilize this size and type wheel. The rigid plate casters are blocked up on the outside centers on the trucks. This provides a highly maneuverable tilt-type conveyance, ideally suited in plants where sharp turns are required.

900 SERIES WITH RENEWABLE RUBBER TIRED WHEEL

Another major advantage of using castered trucks in this and other industrial operations is the elimination of much storage area. The materials in work can be kept right on the trucks in an economical storage fashion until it is ready for the next stage of production. There is no need to transfer materials from handling device to storage area, and back on the materials handling equipment for advancement to the next work area. As the cloth completes one stage of production it can be safely stored temporarily until it is convenient to advance it to the next station. Trucks can be easily parked and selected trucks moved in and out of the temporary storage areas.

9700 SERIES

This is another unusual materials handling achievement for men in industry, made possible by Faultless Casters. Competent engineers, a modern factory, and skilled personnel combine to furnish you the dependable casters you need for your individual operation. Factory trained representatives and selected distributors are on call to help solve your materials handling problems, no obligation.

FAULTLESS CASTER CORPORATION

EVANSVILLE 7, INDIANA

Offices in Atlanta, Boston, Buffalo, Chicago, Cleveland, Dallas, Detroit, Grand Rapids, High Point, Houston, Indianapolis, Los Angeles, New York, Philadelphia, St. Louis, Canada: Stratford, Ontario

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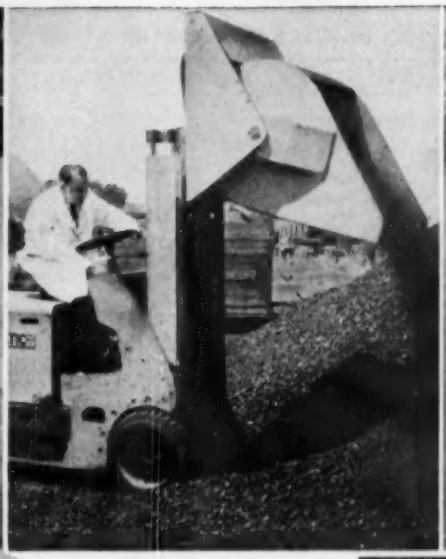
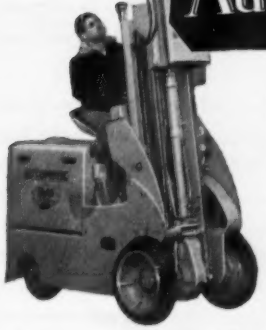


TOUGH PROBLEMS— Automatic SOLUTIONS



Here are but a few examples of Automatic's know-how in designing trucks and special attachments to meet unusual handling requirements.

This know-how can step up the savings in *your* materials handling operation by increased productivity and greater speed in handling your product.

Whether it be a special attachment, or a specially engineered truck, you can always be sure your Automatic truck is *keyed-to-your* job. Send coupon for complete facts.

Exclusive "Earn-Its-Own Way" Plan makes it easy to lease an Automatic or purchase your truck with modest down and liberal deferred-payment terms.

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WORLD'S LARGEST EXCLUSIVE BUILDERS OF ELECTRIC-DRIVEN INDUSTRIAL TRUCKS

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Without obligation, please send me the facts on Automatic "Keyed-For-The-Job" industrial trucks, and free "Cost Cutter" booklet.

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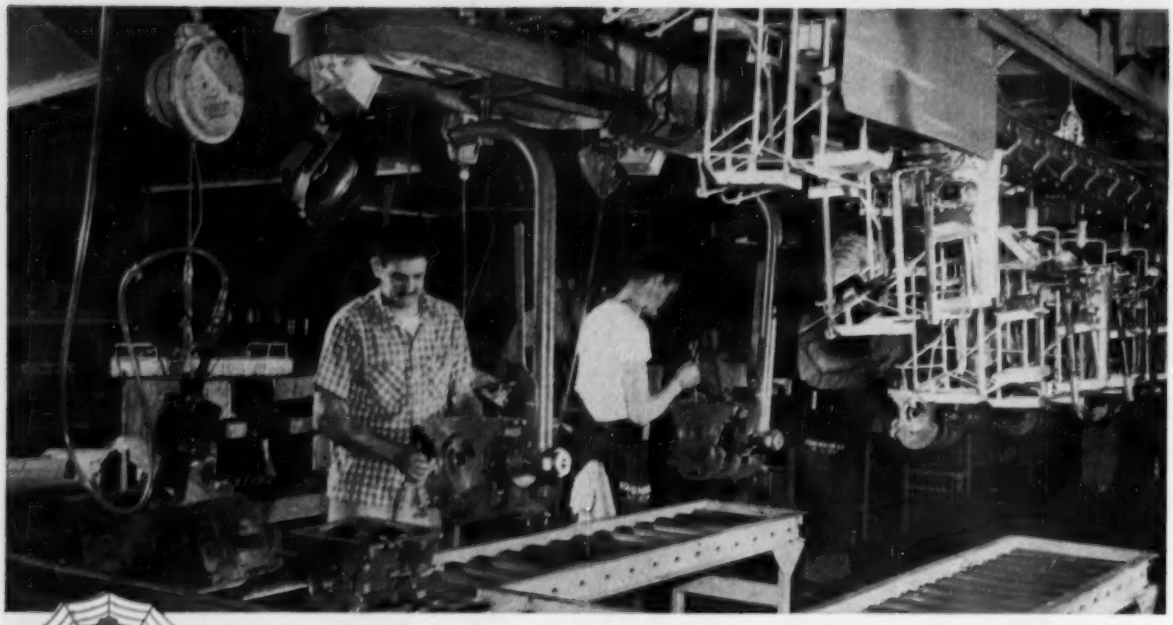
JERVIS B. WEBB

CONVEYOR ENGINEERING, MANUFACTURE, INSTALLATION and AUTOMATION



POWER and FREE CONVEYORS PROVIDE *Flexibility* for Assembly, Testing, Live Storage

This Webb "Power and Free" conveyor system, in the automatic transmission plant of one of the "Big Three" automobile manufacturers, is a prime example of accomplishment in efficiency, reduction of production costs and elimination of manual materials handling.

Starting in the sub-assembly area, a Webb overhead trolley conveyor carries parts to the final assembly department (shown above) where two "Power and Free" conveyors take over and carry the transmissions through every assembly operation. After assembly is completed, another "Power and Free" conveyor provides live overhead storage for the transmissions until they can be taken by conveyor to the test stand area.

In a similar manner, all fifteen "Power and Free" conveyors, located throughout the plant, are synchronized into an automatic system that is thousands of feet long. From the receiving of transmission parts, through final assembly, several live storage areas, testing, and delivery to shipping, the transmissions never leave the Webb "Power and Free" Conveyors.

With Webb "Power and Free" conveyor systems, the power is transmitted from pushers on the power trolleys to the free trolleys which carry the load. When power is not required at specified storage or stationary assembly locations, the power line is raised to disengage the free trolleys. An ever increasing number of manufacturers are finding this system an ideal solution to their production requirements for a conveyor that provides a combination of automatic handling, stationary assembly facilities and live overhead storage.

Write to us on your company letterhead and we will be happy to place your name on the Webb mailing list to receive factual technical information on conveyor installations, case history reports, and new product literature.

JERVIS B. WEBB CO.

Specialists in Custom Conveyor Systems

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Goodyear Industrial Tires
—they're JOB-FITTED

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FAST, ECONOMICAL and VERSATILE HANDLING of DRUMS...

BIG JOE®

DrumToter

ANOTHER IN-BETWEEN HANDLING* TOOL

THE COUNTERWEIGHTER

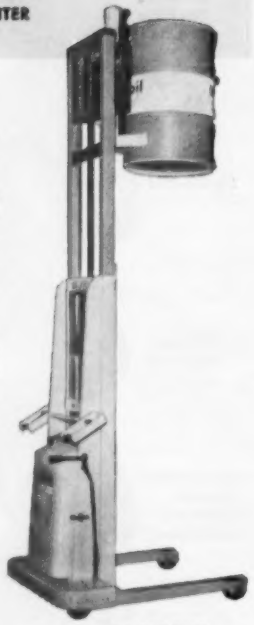
- PICKS UP AND RELEASES AUTOMATICALLY
- HANDLES ANY TYPE DRUM
- WORKS IN ANY LOCATION
- TIERS WITHOUT PALLETS

The "BIG JOE" line of more than 40 IBH* foot and battery operated fork lift trucks is now augmented by the new "DrumToter". This automatic drum handling attachment is easily and quickly installed and removed in a matter of minutes, even by an inexperienced operator. It handles drums of any diameter, regardless of rim size, for exact pick-up and placement wherever you want them.

This new unit further extends the utility of the "BIG JOE" line by making drum handling another fast and economical operation in custom-built "In-Between Handling"* Systems for every department.

Write us for further information on the new "DrumToter" or any of the "BIG JOE" models for IBH*

*Short distance hydraulic manipulation of materials too heavy for manual handling yet not requiring high priced power-driven equipment.



TELESCOPIC MODEL 110

"HYDRAULIC HANDLING FOR *EVERY* DEPARTMENT"

BIG JOE MANUFACTURING COMPANY

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MATERIAL FLOW

March, 1955
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Published Monthly

"Accepted as Controlled Circulation Publication at Pontiac, Illinois."

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"We saved $11,530.00 WITH OUR WHITING TRACKMOBILE"

Trackmobile on its road wheels.

In just *one* year a Trackmobile user saved $11,530 in railway car switching and spotting costs! Their Trackmobile took the place of a locomotive crane formerly used in part for spotting cars and it saved an estimated $2,400 in maintenance costs . . . $6,677 paid for overtime wages . . . $2,453 paid to the railroad company for all intra-plant switching.

How does the Trackmobile make such cost reductions possible? It is far more *efficient* than any other method of switching, spotting and hauling. It travels on *both* track or road, never gets "bottled up" and handles a variety of jobs on different tracks in a matter of minutes. Its operating cost is low. It speeds up freight car movement, reduces demurrage costs, helps increase production!

Important too, the Trackmobile's *initial* cost is surprisingly low!

Write today for complete information!

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15659 Lathrop Avenue, Harvey, Illinois

Reports from other Trackmobile users
● "Previously used winches . . . now, with the Trackmobile, one man does what it took two to do."
● "Because of its versatility, we make greater use of our trackage."
● "Speeds up unloading facilities."
● "Saves time—no pile up of cars."
● "Saves manhours . . . 100% satisfied."
WHITING
WHITING

Trackmobile on its track wheels—ready to couple with railway car.

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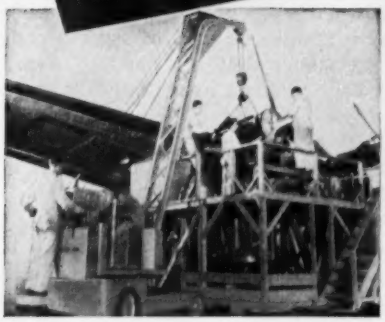
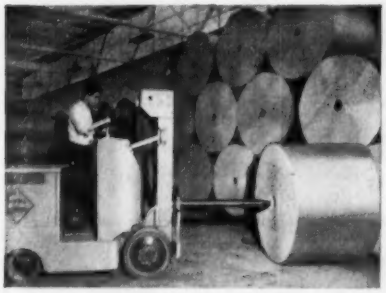
TEN TRICKS *with* TRUCKS

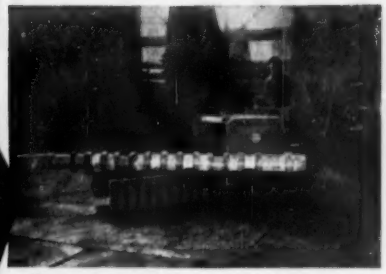


1. *E-P crane lowers bomber engine into place. Twice as fast as previous method, with less labor.*

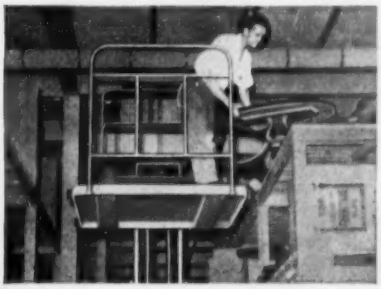


2. *E-P fork truck picks up rolls on ram —even high tiered rolls—with but ¼" difference in size of ram and hole.*

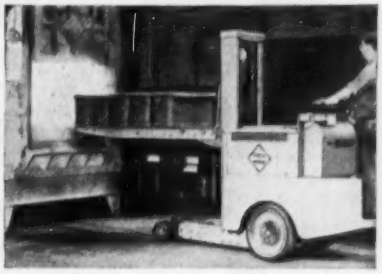
3. *High stacking huge tires with Elwell-Parker fork truck—a skillful operation.*



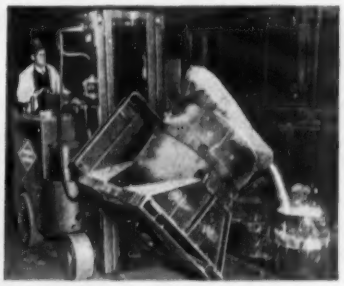
4. *Forged crankshaft, still at luminous heat, safely handled on skid by Elwell-Parker low lift truck.*



5. *Remote control switch enables operator to use fork (with safety steel platform) as elevator. This saves aisle space.*



6. *Platform of this Elwell-Parker enters right into annealing oven to deposit or remove loads.*



7. *E-P Rotary Device permits molten metal to be poured with ease and safety.*

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Special Attachments Folder

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8. *ELPAR engineers replaced platform of high lift truck with 81" forks for these long loads. This cut investment in truck by 40%.*

9. *Note the forward tilt . . . a special clamp stabilizes loads so they cannot bounce from pallet or skid.*

10. *Special E-P device retrieves pallet when load is deposited.*

There's no end to the versatility of ELPAR trucks. One user said, "We have done everything but eat with them!" From Elwell-Parker's vast reservoir of experience—gained during nearly 50 years' specialization in power trucks —industry is drawing a wealth of ingenious handling ideas. You can profit too. Ask your resourceful ELPAR man about applying trucks to unusual operations in your plant. The Elwell-Parker Electric Co., 4233 St. Clair Avenue, Cleveland 3, Ohio.

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INDUSTRIAL TRUCKS

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(complete with batteries and charger)

THE NEW Economy Walkie-Worklifter

for light and medium duty service

Operators say they have never seen anything like it for value and performance.

The low price of the Walkie-Worklifter makes it practical to use a number of these machines at various points throughout your plant, right where they are needed. Avoid delays in waiting for a heavy duty lift truck to come for a light duty job.

The Walkie-Worklifter can be operated by anyone—does not require the services of a fork truck driver.

Walkie-Worklifters are available in many models to handle specific jobs.

Standard platform models with lift up to 110". Straddle type fork models with lift up to 108".

Get the full facts about this new and important development in the Walkie field. Mail the coupon for general bulletin or write, wire or phone for prices and specifications.

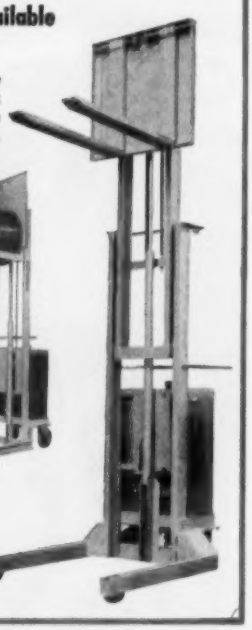
ECONOMY ENGINEERING COMPANY
(Est. 1901)
4524 W. Lake St., Chicago 24, Ill.
Phone—EStebrook 8-9110

Many Walkie-Worklifter models available

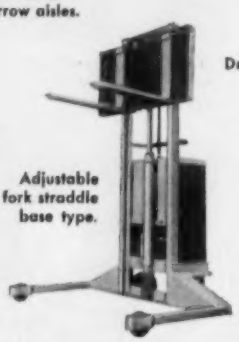
*Standard platform model with 60" lift price $1,148.00. Up and down power lift can be operated simultaneously with maneuvering into position. A safety feature — just let go the handle and it stops itself on the spot.

The Walkie-Worklifter turns sharp corners in narrow aisles.

Telescoper straddle base adjustable fork model for double face pallets. Lift 108".



Drum handling Walkie-Worklifter.



Adjustable fork straddle base type.

ECONOMY ENGINEERING CO.
4524 W. Lake St., Chicago 24, Ill.

Attention Mr. Carl Rhodes

☐ Would like demonstration of Walkie-Worklifter in our plant.

☐ Mail copy of bulletin 54 describing Worklifter in detail.

COMPANY_____

ADDRESS_____

INDIVIDUAL MAKING THIS ENQUIRY WITH TITLE.

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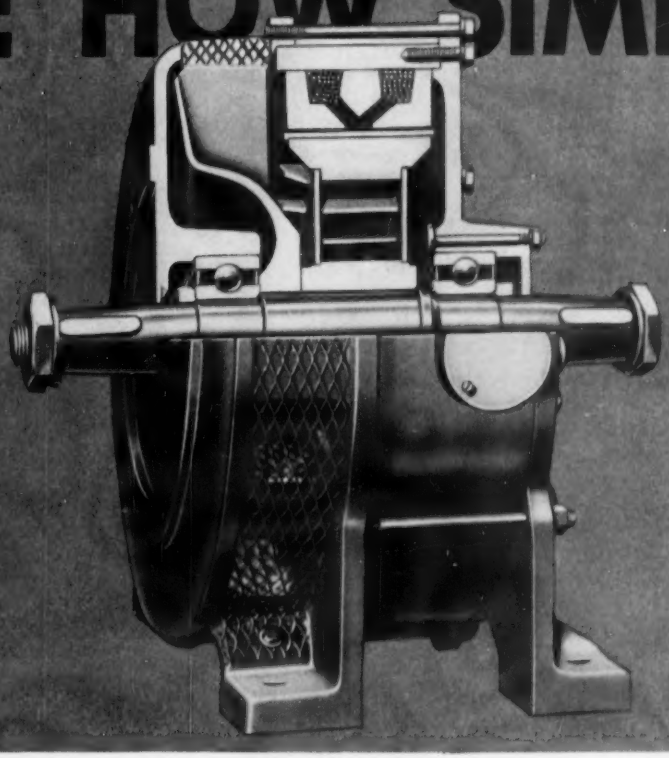
SEE HOW SIMPLE



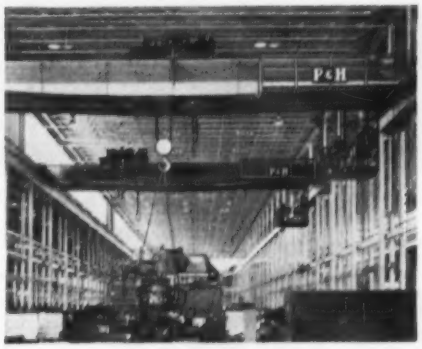
... and only P&H overhead cranes have this better AC CONTROL ... MAGNETORQUE*

Here is what all the talk is about in modern crane control. This is the P&H Magnetorque unit . . . so simple it never requires maintenance.

In this AC crane control there are no rotating electrical parts, never any adjustments to make, no replacements ever needed. With Magnetorque, braking forces are exerted electro-magnetically — without friction, without wear.

As for performance, *this* control provides infinitely fine speed-load characteristics. It's the most responsive crane control yet devised.

Magnetorque is only *one* of the features which distinguish P&H Overhead Cranes as leaders in the field. You can always look to P&H for what's new and better in overhead cranes — soundly backed by the experience of America's oldest and largest producer.



*T.M. of Harnischfeger Corporation for Electro-Magnetic Type Brake.

COMPARE FOR YOURSELF. This new literature contains speed-load curves for all types of crane controls printed on transparent pages so that you can compare one with the other. It clearly explains Magnetorque, has other helpful information. Write for Bulletin C-50.

P&H OVERHEAD CRANE DIVISION
HARNISCHFEGER CORPORATION
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the P&H Line

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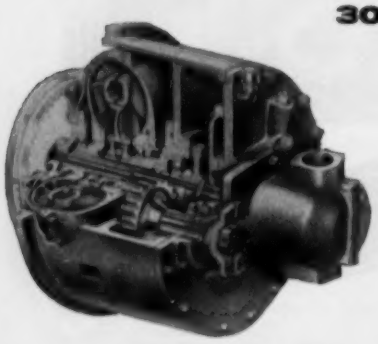
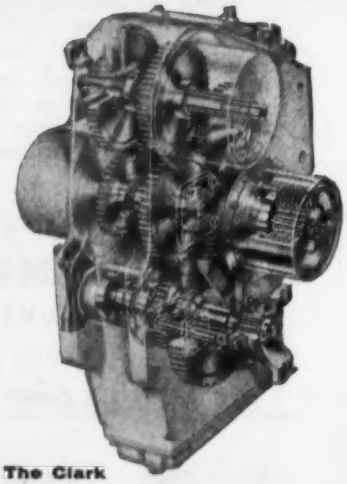
Faster... more power... better traction



The Clark Torque Converter

300% torque multiplication when you need it

1. You get 3-to-1 torque multiplication automatically when the going is toughest—smooth power, maximum traction.
2. You can't stall the engine—instead you get full power on the bucket cutting edge.
3. No clutch—eliminates the chief cause of operator fatigue and maintenance problems.



The Clark Power-Shift Transmission

From engine to tires, the MICHIGAN power train has been engineered for superior tractor shovel service. For complete details and cutaway drawings, write for Tractor Shovel Broadside.

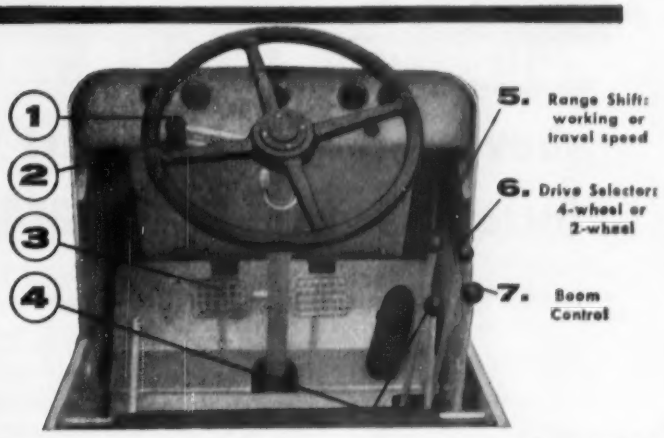
Circle No. 154 on Reader Service Card for more information

—and LOOK, NO CLUTCH !

Until you see a MICHIGAN® in action, you won't believe that a tractor shovel can deliver so much power and traction *with such ease of operation!* There's no clutch pedal on a MICHIGAN—it's as simple to drive as a brand-new car. And having eliminated the engine clutch, the MICHIGAN eliminates the most notorious cause of driver fatigue and excessive maintenance cost.

The MICHIGAN's remarkable ease of operation saves time in every cycle, adds up to more yardage per hour. The operator stays at peak efficiency because he doesn't have to fight a heavy-duty clutch all day.

To really recognize the superiority of this machine, all you have to do is see it in action. It's easily arranged, without obligation—write us for a demonstration. And MICHIGAN Tractor Shovels are available under a low cost Leasing Plan—glad to send you full details.



It's a pleasure to work here!

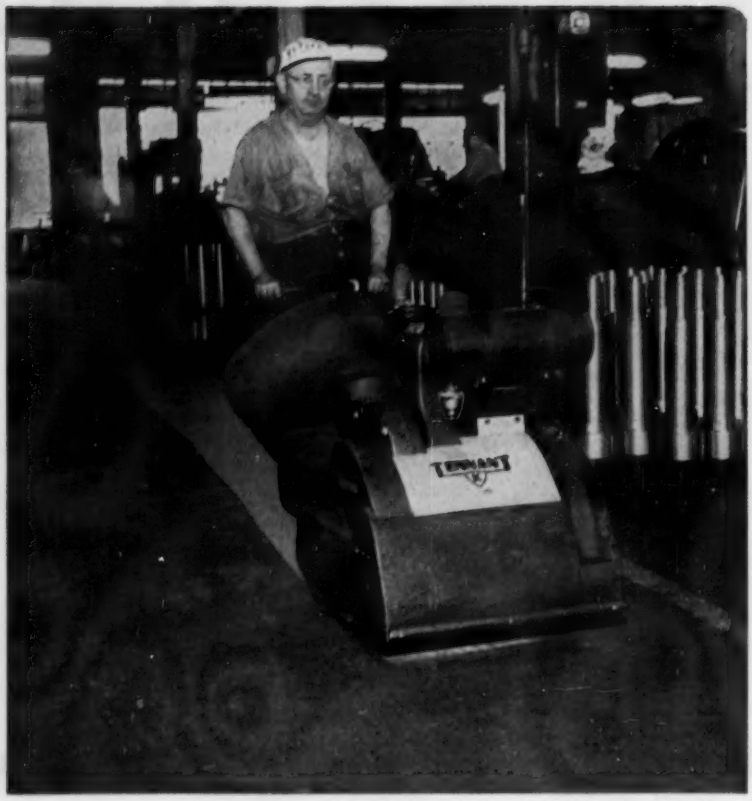
1. **Forward and Reverse:** easy hand-lever on steering column; make either shift while moving in either direction.
2. **High and Low Speeds:** another easy hand lever.
3. **That's no clutch!** It's a double-pedal brake, use it with either foot.
4. **Break-out bucket action:** work the bucket in the pile—you've got 2 double acting bucket cylinders for tremendous break-out power, independent low-level tip back action.

Hydraulic power does the shifting

1. Gears in constant mesh—no gear clash, noise or wear.
2. 4 speeds forward and reverse, up to 27 mph in both directions.
3. Oil re-circulated by pump lubricates entire transmission.
4. Power-shift levers on steering column actuate transmission control valves.
5. To put full power on the bucket, just step on the brake—you automatically put the transmission in neutral.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
440 Second St., Benton Harbor 28, Michigan
Phone: WA 6-6184



TENNANT "K" dry-shaves dirt from floor; cleans 16" path.

How one man with a TENNANT Floor Machine . . .

shaves grease-caked dirt from factory floors – in 1 operation

As you guide it down an aisle, this big powerful TENNANT Machine does a cleaning job you'll find hard to believe. It outperforms a crew of men.

It combines 3 operations, shaving off thick grease-caked dirt at the rate of 8 to 20 lbs. per minute!

1. Shaves off thick deposits from floor by high speed pulverizing action of scarifying cylinder. Cleans 16" path. Works *dry*—no need for water or detergents.

2. Smooths and levels surface by exclusive planing action; doesn't dig or gouge floor. Helps level humps. Leaves good clean surface for fast, safe trucking.

3. Picks up soilage as it goes. Hurls traffic-packed dirt and grime into hopper. Does entire cleaning job in 1 operation. Gas or electric models (to 7.3 hp); also 25 hp mobile-type units. *Write today for details.*

TENNANT
ESTABLISHED 1870

G. H. TENNANT CO.
2576 N. 2nd Street
Minneapolis 11, Minn.

FLOOR MACHINES

Circle No. 50 on Reader Service Card for more information

Too Much Adjusting

To FLOW:

We have a problem which is common to most of our factories.

From six to ten different size products come off our machines, being placed in corrugated cartons of different sizes and placed on a common belt conveyor. The next operation is to seal the cartons.

Our present procedure is to place the cartons into temporary storage on the production floor prior to loading them on the conveyor. The cartons are loaded on the conveyor, one size at a time, and passed through an automatic sealing machine. This sealing machine must be manually adjusted for each different size carton.

We are wondering if there is a carton sealing machine on the market which would handle a reasonable variation in sizes of cartons. The cartons would be intermixed on the conveyor prior to the sealing operation.

A second possibility would be a switching system, so that cartons of each different size would switch onto individual roller conveyors for temporary storage. The sealer operator could adjust his machine to the size desired, and allow the cartons on a particular conveyor to pass through the sealer.

You may know of some organization which has carefully examined this problem and arrived at a solution which would be of interest to us. We will appreciate any leads you can give us.

Ralph Smith
The Diamond Match Company
Springfield, Massachusetts

Before recommending sealing machinery or storage conveyors, it is necessary to have information about expected running speeds, volume of production, sizes of the smallest and largest packages which are involved, and whether

HEY!

come on and take a good look at this

TIGER BRAND WIRE ROPE

Note the size of wires—large enough to provide plenty of resistance to abrasion yet not so large as to cause a stiff, unwieldy rope. Note the full, firm fiber core—it provides the support necessary for resistance to distortion of rope structure. Note the internal and external lubrication—it helps to prevent corrosion and wear.

These construction features were specially selected for this rope to suit it to rugged hoisting jobs in the construction and mining industries, in factories and mills, in logging operations, and aboard ship. For specific recommendations on the use of this and scores of other carefully designed Tiger Brand Ropes, write for a copy of our free booklet, "The Right Rope for the Job." You will find that there is a good Tiger Brand Rope for every wire rope job. Write for your copy today.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION, GENERAL OFFICES: CLEVELAND, OHIO

COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS

UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

USS

UNITED STATES STEEL

Circle No. 14 on Reader Service Card for more information

Automation

WE'VE WORKED TOWARD IT

FOR 50 YEARS AND CALLED IT

CONTINUOUS FLOW

Typical Mathews conveyer system made up of power conveyers and special conveying machinery in modern brass mill.

Mathews conveyers have for 50 years been helping manufacturers progress toward automation by handling materials to and from processing machines with a minimum of manual effort. Today, in almost every industry in plants throughout the United States and Canada, Mathews mechanized handling is at work creating a smooth, continuous flow of materials.

For information, write to the Mathews field office or plant nearest you. Ask for Catalog 853-R.

MATHEWS CONVEYER COMPANY

GENERAL OFFICES . . . . . ELLWOOD CITY, PENNSYLVANIA
PACIFIC COAST DIV. MATHEWS CONVEYER COMPANY WEST COAST. SAN CARLOS, CALIF.
CANADIAN DIVISION . . MATHEWS CONVEYER COMPANY, LTD. PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities

MATHEWS

Circle No. 46 on Reader Service Card for more information

LETTERS

Continued

or not closures must be air-tight or moisture-tight. Also, a knowledge of the plant layout would be helpful.

A storage conveyor system could possibly be the answer to the problem. Baffles could be built over the conveyor leading from the packaging department to the sealing machine. The baffles could be arranged so that one size package would continue straight through and others would be shunted off to storage conveyors located alongside. Then the packages could be fed into the sealing machine as required, thus reducing the number of adjustments necessary on the sealing machine.

We have forwarded a list of manufacturers who might be of assistance to Reader Smith.

Flow Jobber Reports

To FLOW:

Ever since your announcement postcard was sent to the names on our subscription list we have been receiving a most gratifying number of "thank you" letters.

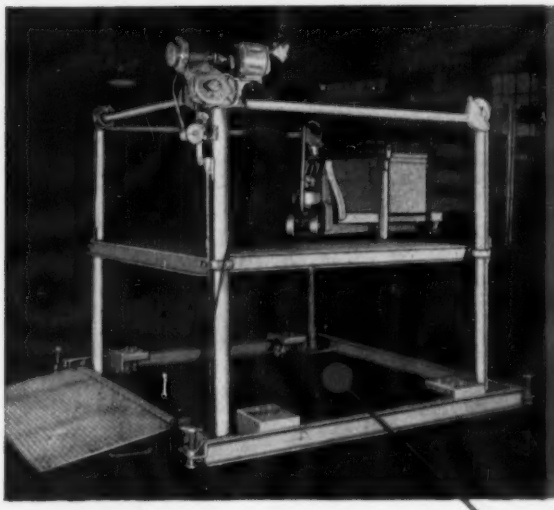
The enclosed copy is typical and we thought might be of interest to you.

L. M. Cowperthwait
Fred Hill & Son Company
Philadelphia, Pa.

Fred Hill & Son Co.,
Philadelphia, Pa.
Gentlemen:

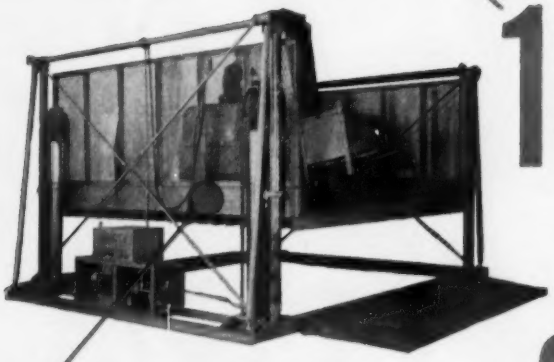
I wish to thank you once again this year for sending me a subscription to FLOW magazine for 1955. I have enjoyed keeping up with the many changes in the material handling field. FLOW does a very able job in giving the reader an excellent picture of these changes as well as articles written by men applying good handling and packaging methods to their operations. I am becoming increasingly aware of the need for better methods in the textile field in order to raise the operating efficiencies of this industry.

G. Dana MacDonald
James Lees & Sons Co.



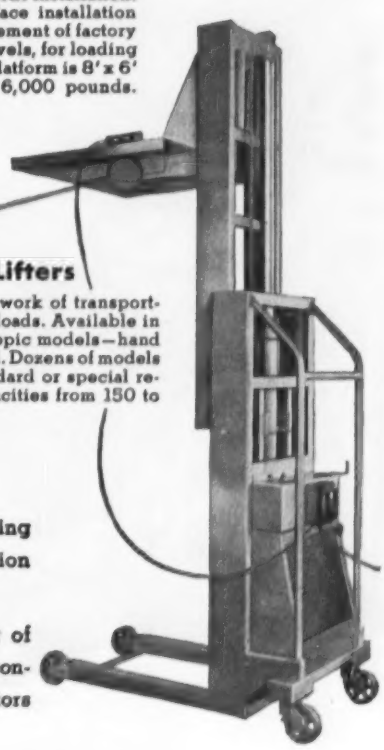
3 Ways

to Make Materials-Handling Easier, Faster and *SAFER* with COLSON LIFTING EQUIPMENT



1 The *COLSON* Leveler

Can be installed anywhere, inside or out, as a portable or permanent installation. No expensive sub-surface installation required. Ideal for movement of factory trucks between floor levels, for loading trucks or freight cars. Platform is 8' x 6' 6", lift is 5', capacity 6,000 pounds.



2 The "Four Poster"

The big brother of the Leveler, this heavy duty machine requires no expensive pit or sub-surface work of any kind. Five standard models, with lifts from 10' to 17', have capacities to 12,000 pounds. Platforms in standard widths and lengths from 5' to 12'. Consult us for "special" lifts and sizes beyond these stated capacities.

3 *COLSON* Lifters

Make quick easy work of transporting and stacking loads. Available in single and telescopic models—hand or power operated. Dozens of models available for standard or special requirements. Capacities from 150 to 3,000 pounds.

COLSON manufactures lifting equipment to meet almost any materials-handling need—from 150 to 12,000 pounds. All are designed for easy, simple operation and maximum safety—built *up* to a standard, not *down* to a price.

Whatever your requirements—it will pay you to consult COLSON, maker of the nation's most varied line of materials-handling equipment. Write us or consult your local phone book (under "Trucks—Industrial"; "Casters" or "Elevators—Portable") for the COLSON office near you.

Write today for free booklet "COLSON Lifting Equipment"

Casters • Hand Trucks • Lift-Jack Systems • Hydraulic, Electric and Mechanical Power Lifts and Transports

THE COLSON® CORPORATION

Elyria, Ohio

Circle No. 116 on Reader Service Card for more information

POWELL

*flow-mation** A GREAT NEW

Flow-mation* in action. Note "right height" hopper that reduces operator fatigue to a minimum. Heavy construction at box door assures long life of unit.

*Trade names of The Powell Pressed Steel Co.

IDEA IN *Materials Handling*

Here's the smartest idea in bulk materials handling containers in the past decade—the Powell **Flow-mation*** System.

A **Flow-matic*** rack is placed at the work station. A lift truck simply sets a **Flow-matic*** box on the rack and the box opens discharging its contents into the convenient, work level hopper—**all automatically.** It's the fastest, easiest handling system yet devised.

Flow-mation* boxes are clean line containers with no protruding corners to snag things or make close stacking difficult. Their Powell originated step type legs mean lock-safe stacking—permit greater stacking heights.

All **Flow-matic*** boxes are ruggedly constructed. Offset lap seam, originated by Powell, assures maximum strength.

Box design enables fork truck handling from any angle. The Powell **Flow-matic*** System is a complete system that includes big double size hoppers, roll-over boxes, dump boxes, funnel boxes, etc.—all compatible to the system in every way.

And for tight areas, where space is limited, the **Flow-matic*** Single Station unit pictured below is ideal.

AND THE PRICE IS RIGHT. Never before was it possible to buy equipment of this caliber at the low prices at which **Flow-mation*** is available. Find out about **Flow-mation*** and you'll find you no longer can afford to struggle along with inadequate or obsolete equipment.

The three-step illustration here emphasizes the ease of operation of the **Flow-mation*** system. Fork lift operator sets box in place. Slanted upper arms of rack makes spotting easy. As box drops into position angle bar of rack contacts angle bar on box door, automatically opening box discharging contents into hopper. There's space at the bottom of the rack to hold second box in reserve.

Flow-matic stacks clean. Absence of protrusions permits closer, higher stacking—gives neater appearance.

The **Flow-mation*** Single Station Unit. Parts are worked out of upper box. Finished parts drop into chute in center of hopper which leads to lower box. Ideal where working space is at a premium.

POWELL
PRESSED STEEL
Since 1920

FLOW-MATION

THE POWELL PRESSED STEEL CO. HUBBARD, OHIO

I would like a copy of **Flow-mation***, the illustrated pamphlet that gives full details of the new Powell **Flow-mation*** System.

Name.....

Title.....Company.....

Address.....

City.....State.....

Circle No. 132 on Reader Service Card for more information

You'll cut handling costs with ROEBLING ALL-PURPOSE SLINGS

You can have these slings with a tapered sleeve attachment with a heavy steel galvanized thimble plus the following attached fittings:

Drop Forged Steel Weldless Hook

Drop Forged Weldless Shackle

Weldless Link

THESE are the easiest-to-handle slings ever put on the market. There are no servings—no bulky sections of rope next to the loop. All wire ends are safely and permanently covered by the tapered sleeve. And on top of that, these slings are remarkably flexible, *doubly* safe, and real time-savers on the big majority of lifting jobs.

Roebling All-Purpose Slings come to you ready for work. They cost less than most other slings and they're a cinch to order. They have the full catalog strength of the "Blue Center" steel wire rope with I.W.R.C. from which they're made, assuring maximum sling service life.

Roebling All-Purpose Slings are stocked in standard sizes and lengths for immediate delivery. Order them from your jobber—and write us for descriptive folder. John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 31 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 19235 LAKEWOOD HGTS. BLVD. • DENVER, 4501 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 221 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, NEW JERSEY

Circle No. 5 on Reader Service Card for more information

Want MORE than you have?

Again Louden engineered handling shows how it can save space, reduce handling and increase production

Over and over again, experience shows you can't buy efficient, speedy, economical materials handling "across the counter." *Right* handling is tailored to your needs. Here is an example. The C. A. Roberts Company, "Steel Tube Specialists" of Franklin Park, Illinois, warehouses steel tubing of every size and length. In its old building, this company *had* overhead handling but neither integrated nor complete. Excessive rehandling and delay resulted; the company had to maintain a handling force up to 6 men. In laying out its new building, a Louden representative planned and delivered an integrated handling system able to cover every inch of floor space. "We can move north, south, east or west in our building with Louden equipment, which definitely means more storage space, less handling of tubing and an increase in production." Two officials estimate production can be increased up to 100%, loading-unloading time cut 50%, and every bit of floor space utilized. Of all the suppliers checked, only Louden could furnish the bridging system that enables them to move tubing from wall to wall with one crane.

Here is the essence of Louden overhead handling . . . *engineering, experience and equipment capable of turning to greatest account the inherent and fundamental advantages of overhead handling.* At the very least you should find out what the best engineering recommends.

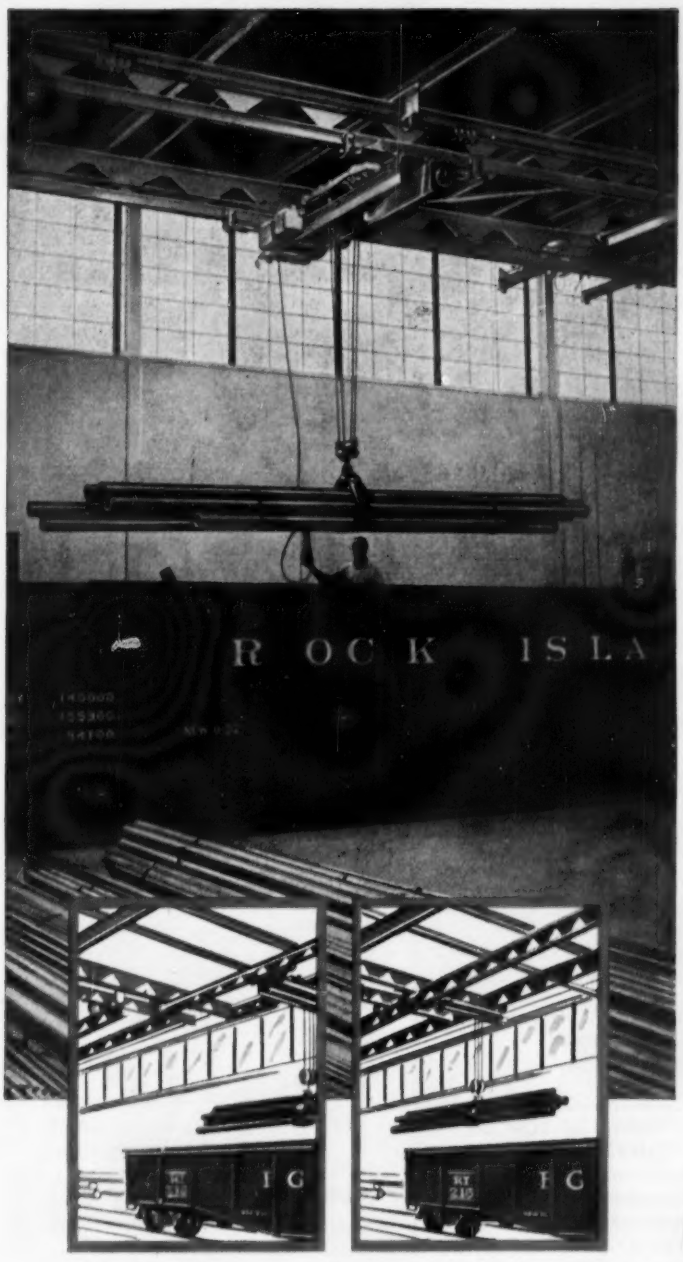


Photo above shows one-man Louden crane unloading ton of tubing. Small sketches show crane aligning with transfer section so load can travel to adjoining crane, without setting load down, to storage in west side of plant.

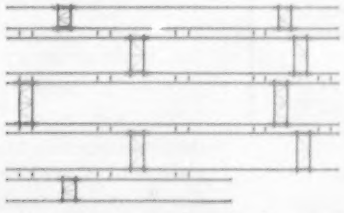
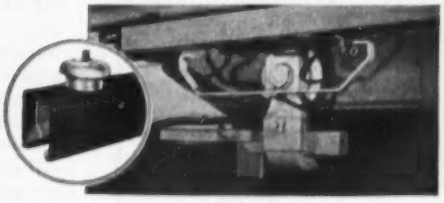


Diagram showing arrangement of overhead crane system. Three aisles of C. A. Roberts warehouse are for storage, two as passageways. Nine Louden Cranes and fifteen transfer sections give complete warehouse coverage. A load can travel to any point without rehandling.



New! Louden Shokpruf Electrification for monorail and crane installations. Hazards of open conductor bars overcome by exclusive development. Write for full details.

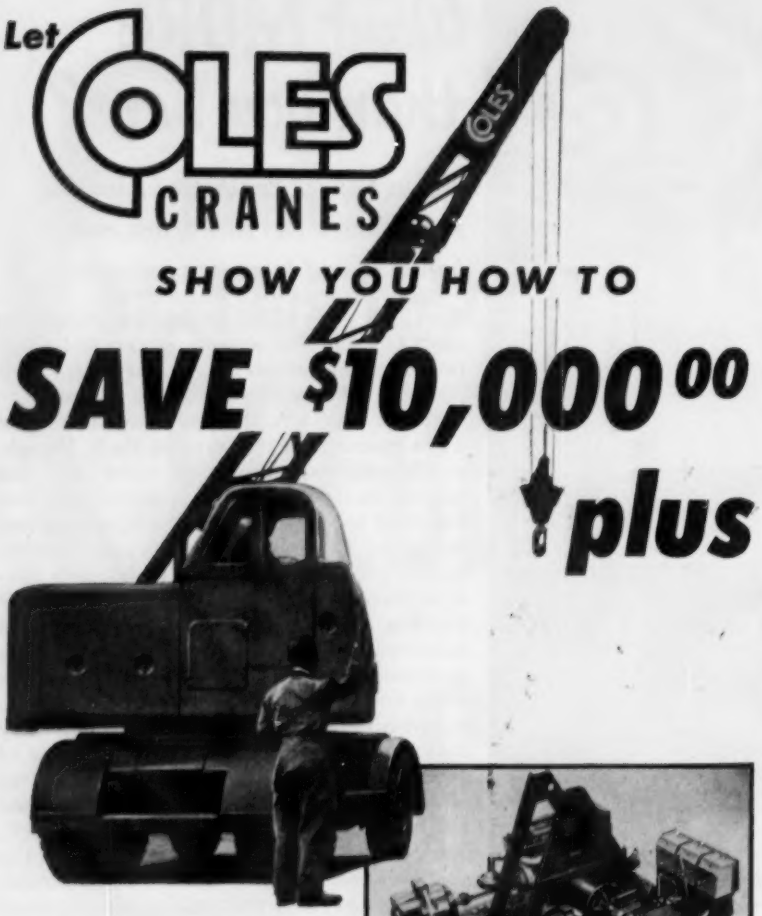
THE LOUDEN MACHINERY COMPANY
5303 Broadway, Fairfield, Iowa
A Subsidiary of Mechanical Handling Systems, Inc.

Louden
MONORAIL & CRANES
SINCE 1867 . . . THE FIRST NAME IN MATERIALS HANDLING

Circle No. 30 on Reader Service Card for more information

Let COLES CRANES SHOW YOU HOW TO

SAVE $10,000.00 plus

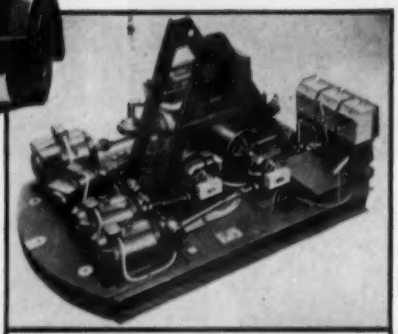


Handling Time Cut From Days to Minutes!

"Apart from the automatic savings made on mechanization of material handling, COLES can offer you greater savings with less *fuel consumption, lower maintenance costs, automatic SAFETY devices,* — economies only possible with COLES gas-electric design. Over 20,000 satisfied customers all over the world attest to the operating economy of COLES CRANES. We invite investigation.

See Coles Demonstrations Booth 833 Material Handling Exposition Chicago, Illinois. May, 1955.

"A Century of Experience Behind Every Crane"



THE ULTIMATE IN TORQUE CONVERSION

There is no comparison with Coles Gas-electric transmission wherever smooth, rapid and accurate positioning is important in handling high ton loads. No gears to shift, no clutch to manipulate, no power absorbing friction . . . in inching movement. Simple to operate, simple to maintain.

THE ONLY CRANE WITH A ONE YEAR WARRANTY

COLES CRANES

COLES CRANES, Inc.
Box 942-F
JOLIET, ILL.

The name that carries weight in material handling . . .

Circle No. 31 on Reader Service Card for more information

news from the SALES FIELD

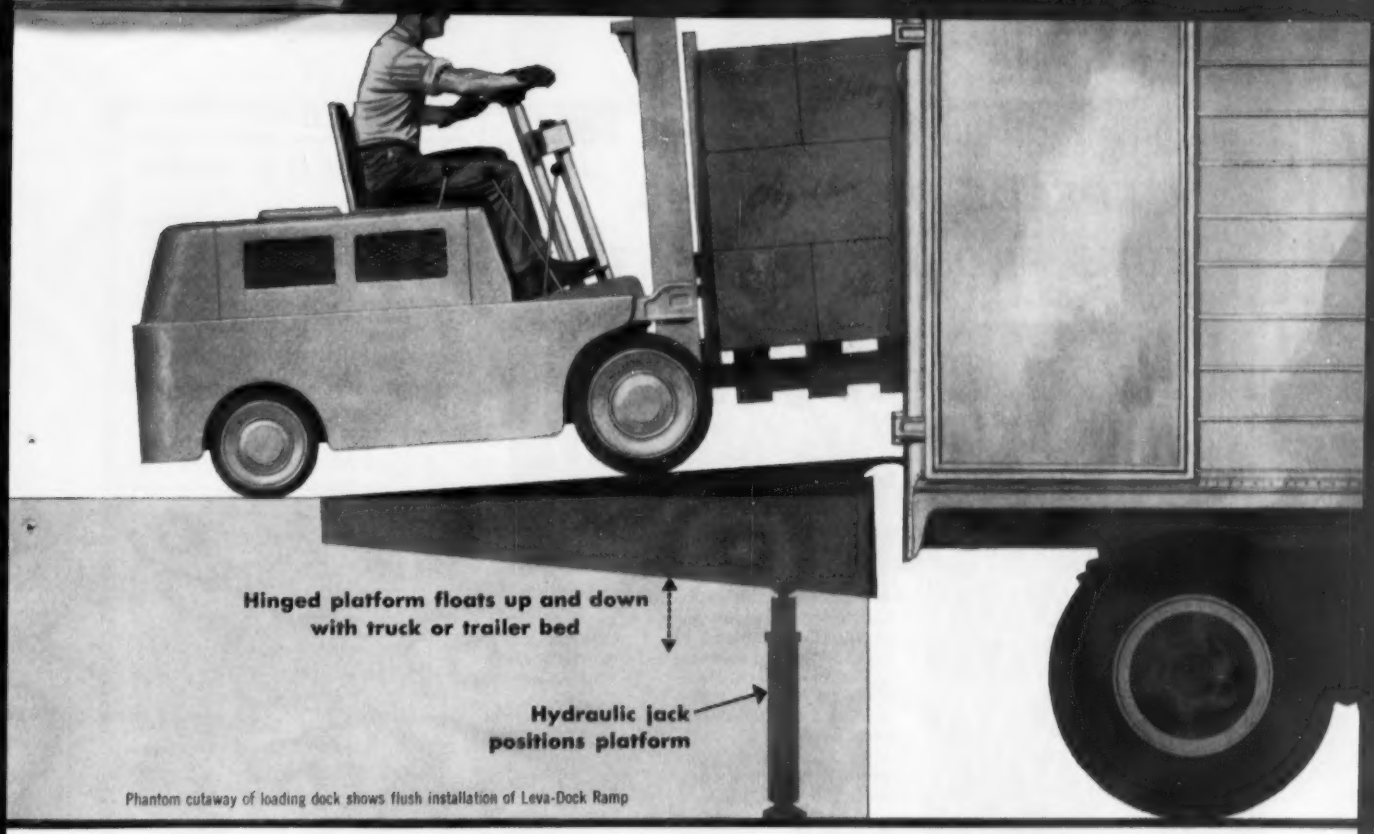
Expansion of the New York sales activities of **Albion Industries, Inc.** has been announced by President **J. F. Karmalski.** Recent appointments to the staff of **Schiff, O'Neill & Company, Inc.,** New York City representative, were **Hal Pearce** and **John C. Gerung.** Both men are widely experienced in the sale of industrial casters and wheels and are well-known throughout the east for their twenty years of service to the industry.

J. C. Gerung

H. Pearce

Wrenn Brothers, Hyster Company dealer in the southeast, has enlarged its territory to include the entire state of Georgia, according to **J. Preston Wrenn.** The company also covers the state of South Carolina and parts of Alabama and North Carolina. Wrenn headquarters are in Charlotte, North Carolina, with branches in Atlanta, Georgia and Greenville, South Carolina.

New field service manager of the **Construction Machinery Division** of **Clark Equipment Company** is **Russell L. McKinley.** He was previously service manager for **Browning Crane & Shovel Company.** The **Industrial Truck Division** of Clark has named **Joseph P. Bradshaw**



Phantom cutaway of loading dock shows flush installation of Leva-Dock Ramp

Leva-Dock Ramps cut loading costs up to 50%

Automatic safety device on all Leva-Docks prevents ramp from dropping if truck pulls away during loading.

FASTER HANDLING! LESS BREAKAGE! GREATER SAFETY!

The LEVA-DOCK, a hinged, self-leveling ramp positioned by a hydraulic jack, fits into your loading dock as shown at left. With this efficient device, power trucks can rapidly and safely move in and out of trucks and trailers. Slow, expensive loading methods are eliminated.

LEVA-DOCK operation is oil hydraulic, powered by self-contained electric power unit or compressed air—very economical and reliable.

For strength and stability, Rotary engineers have developed a rugged torque frame that resists stress and shock. It is available with three types of steel platform.

Hundreds of LEVA-DOCK Ramps are now in use, effecting very substantial savings in loading dock costs for large and small companies. Complete satisfaction is assured by Rotary's experience in building over 100,000 elevating devices.

6 MODELS — FOR OPERATION BY ELECTRIC POWER OR COMPRESSED AIR

Leva-Dock users say:

"Now load twice as many trucks from same platform since installing Leva-Docks."

"Our savings in unloading time are 40% to 50% with Leva-Dock Ramps."

"Average truck loading time reduced from 30 to 14 minutes, with two less men on the job."

Rotary® **LEVA-DOCK® RAMP**

Mail for new catalog

Rotary Lift Co.
1035 Kentucky, Memphis 2, Tenn.
Send copy of Catalog RE-403 and complete data to:

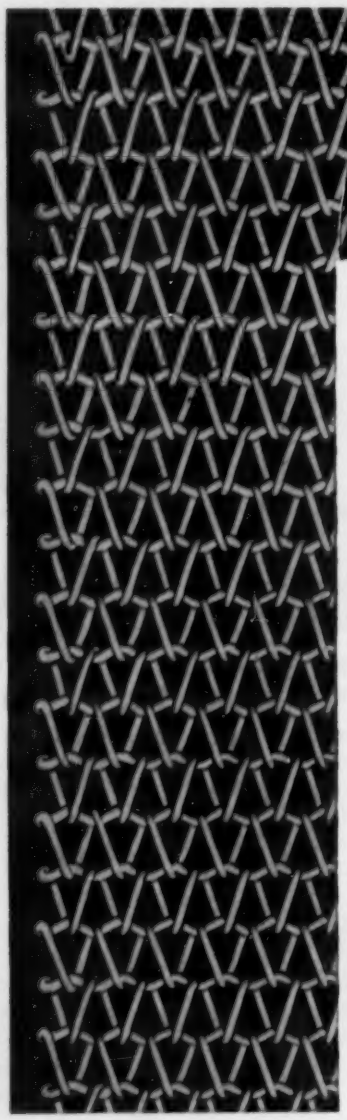
Name.....

Address.....

.....

Circle No. 118 on Reader Service Card for more information

Automatic handling with Cyclone Belts SPEEDS OPERATIONS, CUTS PRODUCTION COSTS



● Efficient materials handling on Cyclone Conveyor Belts has solved a lot of costly production problems in all phases of the manufacture of everything from auto parts to zippers. For continuous, automatic handling on Cyclone Belts means more products can be handled in less time and at greatly reduced costs. The result is almost always increased output at lower unit cost, product uniformity, less waste of time and materials. Often, an awkward and expensive manual operation can be entirely eliminated.

You can probably cut costs in *your* plant with Cyclone Belts. And you can always count on Cyclone Belts for ruggedness, long life and the most efficient design. You can easily have a Cyclone Belt custom-engineered for your particular type of operation. There are many styles, sizes, grades and finishes available. Why not get all the facts from one of our experienced representatives? There's no obligation.

CYCLONE FENCE DEPT.,
AMERICAN STEEL & WIRE DIVISION
UNITED STATES STEEL CORPORATION
WAUKEGAN, ILLINOIS • SALES OFFICES COAST TO COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

SEND FOR THIS VALUABLE CATALOG

It's FREE . . . the big, 32-page illustrated Cyclone Conveyor Belt Catalog #5. It's packed with pictures, specifications and diagrams of the many types of Cyclone Belts and with information about what they can do and where they can best be used. Many pictures show Cyclone Belts in operation in a wide variety of applications. Includes many cost-cutting ideas that may help you.

USS CYCLONE METAL CONVEYOR BELTS

SPIRAL WOVEN
FLAT WIRE • FLEX-GRID

USS

Cyclone Fence
Dept. A-35, Waukegan, Illinois

Gentlemen:

Please send, without charge or obligation, my copy of Cyclone Conveyor Belt Catalog #5.

Name .....
Company .....
Address .....
City .....
State .....

UNITED STATES STEEL

Circle No. 128 on Reader Service Card for more information

western district sales manager, with headquarters in San Francisco. Bradshaw's previous experience includes more than nine years in the sales department of Ross Carrier Company.

J. Ford McGowan is now representing **Mercury Manufacturing Company** in the New England area. Head of a firm bearing his name, he will handle both sales and service for Mercury. He is an active member of the New England Chapter of the American Material Handling Society; has completed graduate work at Harvard Business School, and is presently teaching a course in marketing at Northeastern University.

J. F. McGowan

Exclusive distributor for **Speedways Conveyors Company, Inc.** in northern California is **Hamerslag Equipment Company** of San Francisco. The distributor will stock the complete Speedways line for immediate delivery to West Coast customers.

Stanley Steel Strapping Division recently appointed **Albert B. Anderson** and **Charles D. Watrous** as sales representatives. Anderson will headquarter in Toledo and cover northwestern Ohio, and Watrous will cover the states of Washington and Oregon, headquartering in Seattle.

The Fairbanks Company has transferred **Charles W. Freeman, Jr.** to the Georgia territory and appointed **Douglass Lindsay** to cover the Virginia area formerly handled by Free-

A completely new and different

PAYLOADER®

TRACTOR SHOVEL

NEW MODEL HA

BUCKET CAPACITY
18 cu. ft. PAYLOAD
14 cu. ft. Struck-Load

NEW standards of safety, capacity and low maintenance

The greatest advance in tractor-shovel design in years — with more features — more digging power — more capacity — more performance than you ever thought possible in a tractor-shovel of this size.

The famous HA "PAYLOADER" has led the industry for over 15 years — this NEW 1955 Model HA is even more sensational. It has twice the digging power, lifting capacity and carrying capacity — has 16⅔% more bucket capacity — 18% more dumping height — and will increase output from 50 to 100%.

Before you buy any tractor-shovel, see this new Model HA — ask your dealer for a demonstration — find out what it can do to reduce *your* bulk material handling costs.

Outstanding features:

Powerful "break-out" digging action Upward rotation of the bucket combines with forward motion of machine in a powerful slicing action that gets full loads quickly, even from lumpy, sticky or heavy materials.

Bucket tip-back of 40 degrees when only 6 inches off the ground carries heaped loads *low* and *close* for maximum stability, balance and safety.

New standards of safety Boom arms and parts are mounted *low* and carry loads *low* and are always clear of the operator. Operator visibility is good at all times.

Advance-design hydraulic system includes: sealed, pressurized hydraulic tank — no breathing of dirt and grit into hydraulic fluid; hydraulic accumulator prevents pressure shocks — gives easier, safer control.

Torque-converter drive and full-reversing transmission with two speed ranges insures fast moves in either direction — easier operation and control — more production.

Improved steering. Ball-bearing screw-and-nut type steering with tapered roller bearing bell crank and oversize ball joints — easy-acting, readily-adjusted, low in maintenance.

GAS OR DIESEL POWER OPTIONAL.

THE FRANK G. HOUGH CO.
711 [illegible]

☐ Send me complete model HA information

☐ Send name of my "PAYLOADER" Distributor

Name .....

Title .....

Company .....

Street or Box No. .....

City ..... State .....

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. • LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

Circle No. 125 on Reader Service Card for more information

SALES FIELD

Continued

man. Both territories will be serviced from the Rome, Georgia factory and warehouse.

J. C. Corrigan Co., Inc. opened a sales office in Boston, Massachusetts, several months ago. **Gilbert Lavoie** heads the new facility.

Manager of electronic sales, **Diamond Power Specialty Corporation** is **Willis I. McCord**, formerly with Allen B. DuMont Laboratories. A graduate of Rutgers University, McCord's chief responsibility is the direction of sales of Diamond closed circuit industrial television systems.

W. I. McCord

Virgil Owen has joined the sales staff of **Wire Products Division, Union Steel Products Company,** and will cover the territory of Southern Indiana, Kentucky and Tennessee. From 1946 to 1954 he was president and general manager of the Rapids Handling Equipment Company of Buffalo, and is particularly well known for his activities with the American Material Handling Society of that city.

New export sales manager of **Hyster Company** is **Harvey A. Raasch**, veteran of more than 15 years' experience in the export sales field. He was previously associated with the Le Roi Company and Allis-Chalmers Manufacturing Company, and is a past director of the Export Managers Club of New York.

H. A. Raasch

Newt Crum will now represent **Flexible Steel Lacing Company** exclusively in California, Arizona and Reno, Nevada. He has represented the company for the past five years, and will now devote his entire efforts to promotion of Flexco and Alligator products.

Three new dealers have been appointed by **Tote System, Inc.** They are **Jefferds & Moore, Inc.**, Charleston, West Virginia; **Stanley G. Kroto**, Cleveland, Ohio; and **R. T. Patton**, Newcastle, Pennsylvania.

Four recent distributor appointments were announced by **The Forker Corporation.** Named were **American Equipment Co., Inc.**, Milwaukee, Wisconsin; **E. I. Knorring & Company**, Chicago, Illinois; **The Fred Thrasher Co.**, Jackson, Mississippi; and **Urban M. Lodge**, Denver, Colorado.

The perfect bridge between truck and dock...

RITE-HITE® ADJUSTABLE LOADING RAMP

can solve many of your loading dock problems

PERMANENT-TYPE RAMP becomes an integral part of loading dock. Can be installed in new or existing construction at very low cost. Horizontal adjustment feature reduces truck maneuvering.

SELF-CONTAINED RAMP AND DOCK for non-permanent installation. Ideal for leased buildings — can be moved easily to new location. Horizontal adjustment feature reduces truck maneuvering.

FLUSH-TYPE RAMP for permanent installation. Can be locked in position flush with loading dock surface when not in use. Dock traffic can travel over it freely.

3 TYPES . . . EXCLUSIVE RITE-HITE PRECISION COUNTERBALANCE . . . no pipes, pumps, gears, motors . . . little or no maintenance required.

5 MODELS to choose from . . . 10,000 and 20,000-pound capacities . . .
Priced from $395.00.

RITE-HITE® DIVISION
LOOMIS MACHINE COMPANY
FOURTH AND PINE STS. • CLARE, MICH.

Plan now to install RITE-HITES . . . write Dept. F-35

Circle No. 124 on Reader Service Card for more information

LIMA wagon cranes are self-propelled units with one engine mounted in the rotating assembly supplying the power for all crane operations. LIMA wagon cranes are available in 15, 20, 25, 30, 40 and 50 ton capacities.

LIMA'S fast service cuts costly downtime

From coast-to-coast Lima service engineers, warehouses and distributors are prepared to give you that extra-fast service or parts delivery which can make all the difference between continuous, profitable production and high-cost idleness of equipment.

When you buy a LIMA you can depend on long, trouble-free service, thanks to those extra quality features built into every LIMA. But if trouble happens and you need help, you get it from Lima . . . fast!

COMPARE QUALITY! No other machine gives you as much as LIMA!

1. Piston ring type dirt seal rings and retainers in crawler rollers.
2. Moving parts are flame or induction hardened for longer life.
3. Main machinery is placed well back of center of rotation.
4. Anti-friction bearings at every vital bearing point.
5. Big capacity drums and sheaves are easy on cables.
6. Propel and swing gears and power take-off are enclosed in a sealed oil bath.
7. Torque converter (optional on certain types).
8. Wherever you are, you can depend on skilled service and nearby warehouse stocks of parts to keep your LIMA on the job continuously.

COMPARE and you'll specify LIMA for shovels (¾ yd. to 6 yds.), cranes (to 110 tons) and draglines (variable). Smaller capacities available on rubber.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

BALDWIN BLH LIMA-HAMILTON

LIMA SHOVELS · CRANES · DRAGLINES · PULLSHOVELS

BALDWIN-LIMA-HAMILTON

Construction Equipment Division · LIMA · OHIO · U. S. A.

Circle No. 109 on Reader Service Card for more information

NEWS VIEWS TRENDS

COLSON PURCHASED

Robert A. Pritzker, president of The Colson Corporation, announced the purchase of Colson by F. L. Jacobs Company, automotive parts manufacturer. Pritzker said the move will provide the wheel goods manufacturer with additional working capital and will enable it to implement a long range expansion program. Frank E. Howard, chairman of the board of Jacobs, said the acquisition is part of his company's diversification program. Pritzker will continue as operating head of Colson, now a wholly-owned subsidiary.

"MOVEMENT IS LIFE"

The Conveyor Equipment Manufacturers Association is sponsoring a new 20-minute 16 mm. motion picture entitled "Movement Is Life". The scope and variety of jobs done by conveyors through the economy are depicted in scenes of actual installations. Primitive methods of handling, used in building the Pyramids and still prevailing today, are contrasted with modern mechanized movement. The script is said to show how mechanical handling by conveyors increases employment and profits and raises the standard of living. Black-and-white prints may be borrowed from Modern Talking Picture Service, 45 Rockefeller Plaza, New York City.

BARRETT'S LEASE PLAN

Three year and five year leasing arrangements are available to users of Barrett-Cravens Company equipment. Under the plan all monthly payments the customer makes are fully deductible for Federal Income Tax purposes. There is no option to buy the equipment either during or at the expiration of the lease. The omission is to make certain the rights of the customer to deduct rental payments as operating expense. Equipment rent may be budgeted where the annual budget policy is employed.

RACK BUILDS IN CALIFORNIA

Opening of a new fabricating and assembly plant at Gardena, California, was noted recently by Rack Engineering Company. The new plant will make the company's material handling products readily accessible and more competitive in the West Coast area. Vice president in charge of sales and manufacturing, M. A. Travis, will direct the new operation.

A-C NEGOTIATES FOR BAKER MFG.

Allis-Chalmers Manufacturing Company is negotiating to acquire the total assets of Baker Manufacturing Company. There was no disclosure of proposed terms of sale or other financial arrangements by either W. A. Roberts, Allis-Chalmers president, or W. C. Staley, Baker president.

FIELDEN INSTRUMENT TRIPLES SPACE

Fielden Instrument Division of Robertshaw-Fulton Controls Company has expanded its plant and office facilities in Philadelphia to three times the former area. Ralph V. Coles, assistant vice president of the company and general manager of the Fielden Division, said a new engineering and technical service office has been established in St. Louis to serve the Central States.

Why a *Master*® truck is your best fork truck buy—

1 Electric power gives 3 times longer life than gas trucks

2 Lubricated-for-life — never needs greasing — absolutely no under truck adjustments

3 ¼ the operating and maintenance cost of gas trucks

4 Magnetic controls — no clutch . . . operate one lever to change speed and direction

5 Standrive operating position for faster, safer, more comfortable forward and reverse operation

6 Center control and one-step-high thru-truck aisle for easy mounting from either side

7 Travel speed up to 6 MPH for maximum efficiency plus safety

8 40 FPM lift speed (with full load) 50 FPM lowering speed

9 Capacities through 4000 lbs. (48" load length)

L-S SPACEMASTER MODEL "E" ELECTRIC
2000 lbs. capacity

IN ADDITION to the 9 points of superiority (above) of L-S SpaceMaster Electrics, there are many more reasons why Master Line Trucks are the best buy on the materials handling market.

Here's one. Lewis-Shepard offers *every type of truck made* — from lightweight two-wheelers to huge fork lifts. You get the extra convenience of "one-stop shopping" for *all* your truck needs. And you get all the benefits of standardizing on one make of equipment.

Here's another. Because your local L-S Representative has a *complete* line, he's in a better position to advise you . . . he's not biased in favor of one particular type of truck or design. So, for the most economical solution to your handling problems, buy from the only *complete* line of trucks on the market . . . the Lewis-Shepard Master Line! For catalogs describing SpaceMaster Model "E" Electrics or the complete Master Line, mail the coupon . . . *TODAY!*

Circle No. 44 on Reader Service Card for more information

LEWIS-SHEPARD

"Master" line

133 Walnut St., Watertown 72, Mass.

Please send L-S SpaceMaster Model "E" Catalog No. 32
L-S Master Line Catalog

Name ..... Title .....

Company .....

Address .....

City ..... State .....

Continued

DUTCH DOW

Permission to establish a wholly-owned subsidiary company in the Netherlands was granted The Dow Chemical Company by the Netherlands Minister of Economic Affairs. The company will be known as Nederlandsche Dow Maatschappij N.V., and will be located in Rotterdam. In addition to introducing basic chemical products to Dutch industry, Dow President Dr. Leland I. Doan said the subsidiary will supply technical information for their use to help stimulate increased production of finished goods within The Netherlands economy for export and domestic sale. John Van Stirum will manage the foreign operation.

CLARK OPENS, EXPANDS NEW PLANT

Expansion plans are already underway by Clark Equipment Company's Construction Machinery Division, even though the company's recently completed 150,000 square foot structure has been occupied for only a few months. "The general outlook in the construction industry and the acceptance of our new line of products by contractors indicate the need for additional facilities," said President George Spatta. A contract for a 60,000 square foot expansion has been let. The structure will include machine shop facilities, additional raw material storage and a section that will allow consolidation of engineering and administrative personnel at one location.

WEBB LICENSES AUSTRALIAN FIRM

Jervis B. Webb International Company has entered into an agreement with Bishops Implements Pty. Ltd. of Melbourne, Australia, to manufacture and install Webb conveyors in the Commonwealth of Australia and mandated territories. The licensing was established to permit more ready payment in Australian currency, and to provide the best possible customer service in Australia's expanding industrial market.

GAIR BUYS HARVEY

Robert Gair Company, Inc. has acquired the properties, assets and business of Harvey Container Corporation, Plymouth, Michigan. It is planned to operate the business as the Harvey Container Division of Robert Gair Company, Inc. Charles U. Harvey, president of the newly acquired plant, will remain in charge of the Plymouth operation and will also supervise other Gair container plants in the Middle West. George E. Dyke is Gair's president.

KELLER TOOL CONSOLIDATES

A consolidation of Keller Tool Company and Gardner-Denver Company has joined two prominent manufacturers of air compressors, air tools and equipment. Keller now becomes a division, and will continue operations under its former management. Sales activities of the two companies will be coordinated. E. V. Erickson, Keller president, has been elected an executive vice president of Gardner-Denver Company. Gifford V. Leece is president of Gardner-Denver.

LAKE PLACID CONFERENCE

Solving of actual problems which industrial companies meet in day-to-day operations will be emphasized at the Second Annual Material Handling Training Conference, June 19-July 2, in Lake Placid, New York. "The aim of the Conference is to provide a practical, how-to-do-it training program for company executives on a middle management or staff level," said Director James R. Bright. Leading figures from industry will comprise the teaching staff.

A CHOICE FROM OVER
100 MECHANICAL HANDS

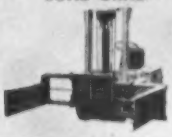
Makes a Hyster® Lift Truck right for your job

YOUR BUSINESS IS DIFFERENT, AND YOUR HYSTER DEALER RECOGNIZES THAT DIFFERENCE BY PROVIDING A LIFT TRUCK WHICH IS EQUIPPED RIGHT FOR YOUR JOB. WHETHER YOU HANDLE BOXES, BAGS, BALES, BOTTLES, CARTONS, ROLLS, CRATES, PIPE, DRUMS, LOOSE MATERIALS, BULKY OR ODD SHAPES...

CALL YOUR NEAREST HYSTER DEALER TODAY...OR WRITE FOR BOOKLET 1266.

HYSTER OFFERS OVER 100 JOB-HANDLING "MECHANICAL HANDS" AS ATTACHMENTS FOR YOUR LIFT TRUCK:

LOAD-GRAB®



BOOM

SCOOP

HYDRAULIC SIDE-SHIFT

REVOLVING LOAD-GRAB

RAM

PULPWOOD LOADER

TILE-HANDLING ARMS

THERE'S PROFIT IN HYSTER POWER

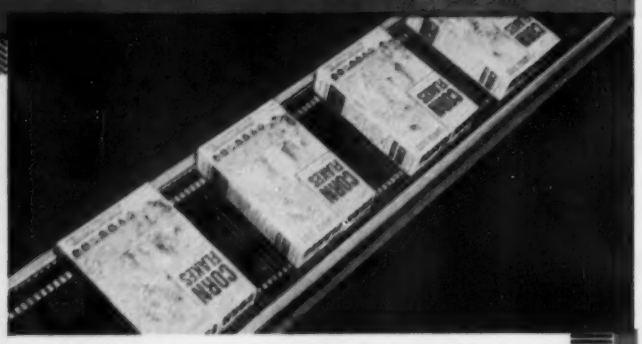
HYSTER COMPANY

2931 N. E. CLACKAMAS STREET.....PORTLAND 8, OREGON
1031 MYERS STREET.....DANVILLE, ILLINOIS
HYSTER N.V. .....NIJMEGEN, THE NETHERLANDS

Four Factories: Portland, Oregon; Danville, Illinois; Peoria, Illinois; Nijmegen, The Netherlands

Circle No. 111 on Reader Service Card for more information

USP WENDWAY



Automatic answer to your "LIGHT PRODUCT" conveying problems!

If you have a light package, 20 lbs. or less . . . if you must move it smoothly, efficiently, from one process to the next...or if you want an automatic selective conveyor system to do the job dependably and at a constant savings in time and manpower . . . then Wendway is for you!

Wendway specializes in moving light goods swiftly, quietly and safely anywhere in your plant. Standardized, self-powered sections of Wendway can be installed virtually anywhere—overhead or in multiple tiers to save your floor space. Wendway will pass through walls, go upstairs or down...around obstructions. So...whether your problem is assembly, processing, packing, order picking or inspection, you'll find Wendway pays for itself from the day it's installed.

Packaging or assembly operations can be synchronized to production, thanks to Wendway's variable speed control. Here, fancy sets are "Wendrayed" from box loaders through a series of stapling machines and on to shipping boxes.

Overhead cooling for cooked or heated products saves you time and floor space. Wendway takes 'em up, cools 'em off and brings 'em down, ready for further processing. Individual gear-head motors can be remote controlled to give you complete automatic operation.

Loading operations get a big boost with selective Wendway tiers reaching exactly the areas you want, where you want them, from any part of your plant. Versatility of standardized sections keeps installation costs low, maintenance costs lower.

Wendway's special steel wire belting rides smoothly over powdered iron sprockets mounted on sturdy steel shafting. Can not slip or run out of line. Easy to clean and keep clean.

Belt track and channel of heavy-gauge steel, galvanized for longer life and appearance. Exclusive pure Nylon belt guides and bearing strips for quiet, friction-free operation.

Detailed information on Wendway available on request. USP Conveyor Engineers are also at your disposal.

UNION STEEL PRODUCTS CO.

ALBION, MICHIGAN

Circle No. 115 on Reader Service Card for more information

MEN in the news

. . . at Lamson Mobilift Corp.

John R. Titlow has been named manager of sales, and will have complete charge of sales and service for the entire Mobilift line. Well known in the material handling field, Titlow was associated with Clark Equipment Company for a number of years, where he most recently was general sales manager of the Industrial Truck Division. He has been active in the Industrial Truck Association and Material Handling Institute, among other societies, and is a graduate of Ohio State University.

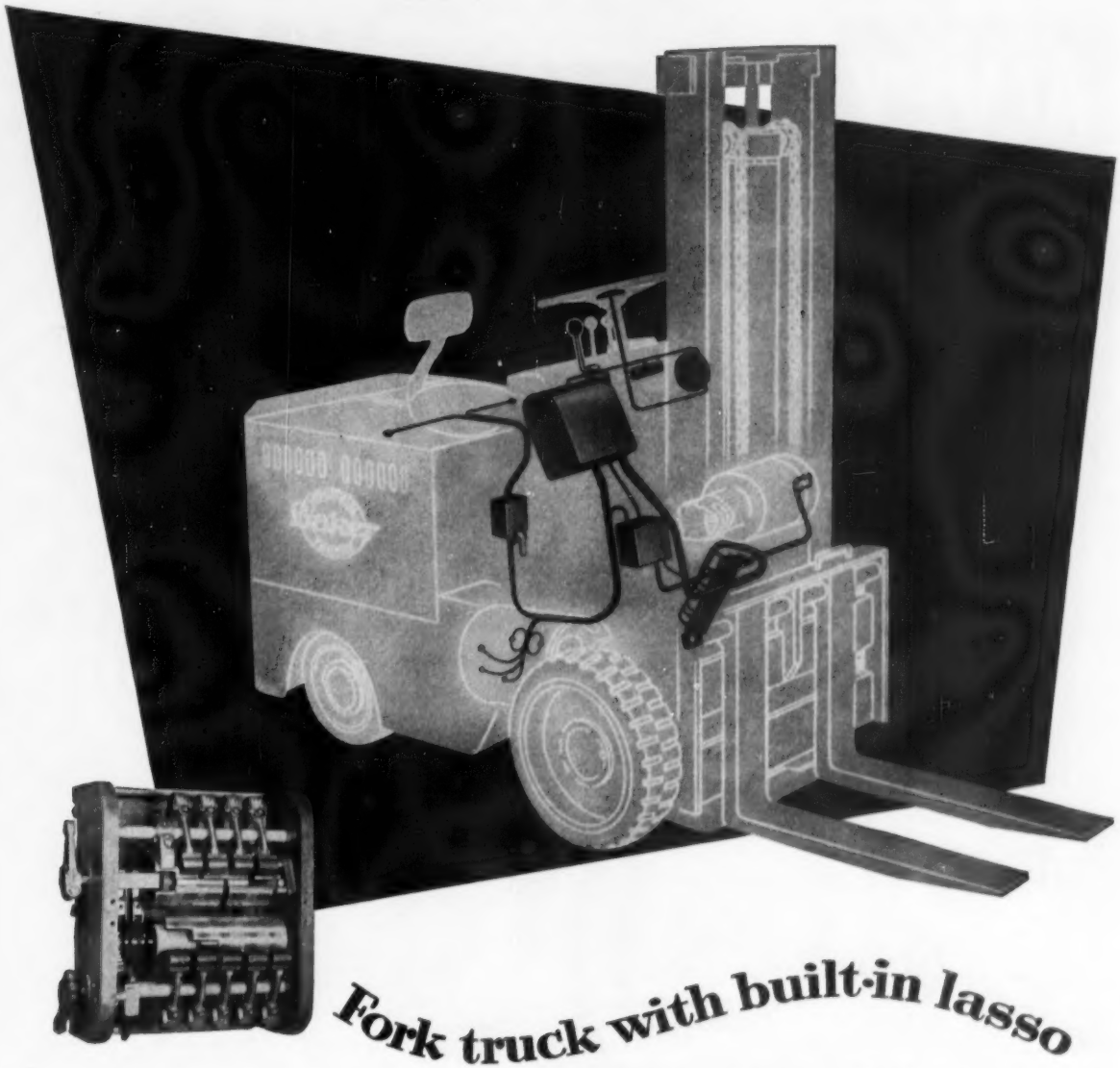
J. R. Titlow

. . . at Stephens-Adamson Mfg. Co.

Co-founder **W. W. Stephens** died at the age of 87 at his home in Pasadena, California. His first connection with the conveyor industry was in 1887 when he went to work with Webster & Comstock Manufacturing Company. In 1901 he and his partner, the late Frederick G. Adamson, formed the present Stephens-Adamson Company. In 1924 he resigned as president, but continued to serve for some time as chairman of the board.

. . . at National Metal Edge Box Co.

Promotions in top-management personnel have been announced. **Malcolm P. Junkin** is senior vice president; **James**



Fork truck with built-in lasso ...for cowboy drivers

● Over-enthusiastic truck jockeys can't hurt Baker Fork Trucks or loads carried (or themselves) by jumping from "low" to "high" or forward to reverse.

Baker drum-type controllers take motor speed in successive steps through acceleration stages, no matter how "heavy" the foot on the accelerator.

Jack-rabbit starts, with resulting motor burnouts, are impossible. Dynamic braking slows truck to a smooth stop, sparing driver and load, and acts as auxiliary brake on steep grades.

Motor strain or jolt from sudden direction changes is prevented by requiring truck to come to a virtual stop before reversing circuit applies.

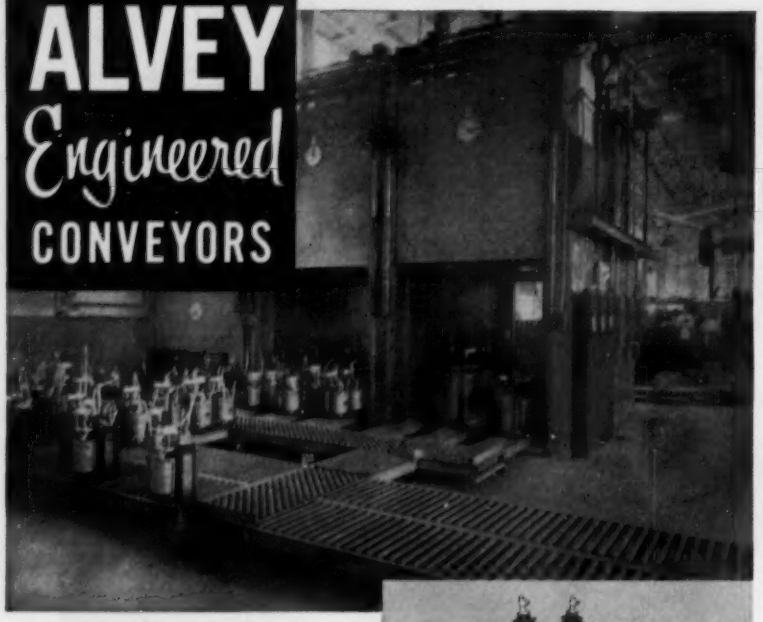
All this adds up to safer operation for driver, truck and load, less down time, lower repair bills and longer truck life.

For more detailed information on Baker Fork Truck features, write for 4-color sketch book —Bulletin 64. The BAKER-RAULANG Company, 1219 West 80th Street, Cleveland 2, Ohio.

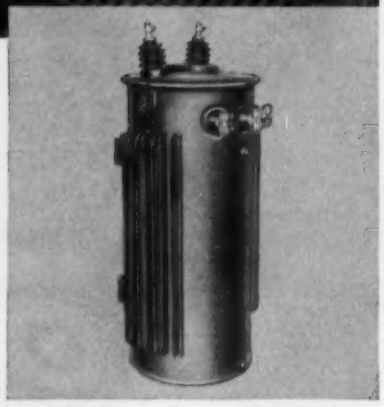
Baker.
industrial trucks

Circle No. 180 on Reader Service Card for more information

ALVEY *Engineered* CONVEYORS



Improve the handling of materials in process



These transformers built by Wagner Electric Corporation travel on Alvey Conveyors.

Like many other leading manufacturers, Wagner Electric Corporation, St. Louis, uses Alvey Conveyors in the manufacture of such products as transformers, electric motors and hydraulic brakes.

Smoothing and synchronizing the flow of materials and parts in manufacturing operations is the special talent of Alvey Conveyors. It's only natural that Alvey equipment should do so much, so well. Each conveyor system is *job-engineered* by men who are qualified by knowledge and experience to develop a successful layout.

An Alvey Engineer will be glad to visit your plant . . . to work with you for savings in time and money, for improved production as well.

ALVEY CONVEYOR MFG. CO.
9299 OLIVE STREET ROAD, ST. LOUIS 24, MISSOURI

BRANCH OFFICES IN PRINCIPAL CITIES

ALVEY

Circle No. 98 on Reader Service Card for more information

MEN IN THE NEWS

Continued

Eiseman is vice president; and **Charles Paist, III,** appointed director of sales last year, was given full responsibility for all sales functions.

. . . at Acme Steel Company

Chairman of the Executive Committee, **Chester M. MacChesney,** has retired after 38 years of service. A pioneer in the material handling field, MacChesney holds more than 50 patents on industrial inventions. He is a well known Chicago community leader and patron of the arts . . . **Walter F. Hinkle** was recently elected to the post of vice president of engineering. He joined the firm in 1925, and in 1953 was named director of engineering and research. He is also in charge of Acme's mechanical and electrical divisions.

C. M. MacChesney

. . . at Lamson Corporation of Delaware

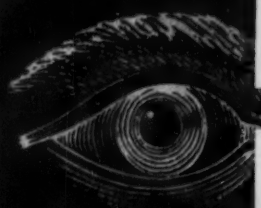
Changes in top management responsibilities were announced by President **Carl F. Dietz.** Under the revised set-up, Dietz assumes a new post as chairman of the board. **Francis D. Weeks,** who is currently vice president and treasurer of all companies in the Lamson group, will succeed Dietz as president and also chairman of the board of Lamson Mobilift Corporation. Dietz became president, a director, and chairman of the executive committee of Lamson Corporation of Delaware and each of its subsidiaries in 1938. In 1952 he relinquished the presidency of Lam-

F. D. Weeks

FLOW

Circle No. 148 on Reader Service Card

USE THIS TICKET TO SEE THE GREATEST NATIONAL MATERIALS HANDLING EXPOSITION IN HISTORY!



International Amphitheatre, Chicago
May 16 to 20, 1955

SEE NEW DEVELOPMENTS IN MATERIALS HANDLING THAT MAKE PRESENT MACHINES AND METHODS OBSOLETE—EXHIBITED BY THE INDUSTRY'S PACEMAKING, PROGRESSIVE MANUFACTURERS.

Tear out ticket along the dotted line. Properly filled in, it will admit you to the 6th National Materials Handling Exposition. No other registration is required. For additional tickets, write to the Exposition Management, Clapp & Poliak, Inc., 341 Madison Avenue, New York 17, N. Y. There is no charge or obligation.

(OVER)

THE EXPOSITION MANAGEMENT

invites you to attend the

6th National Materials Handling Exposition

Hundreds of exhibits . . . brand new products, methods, and ideas . . . shown by the pace-setting companies who believe that the technology of materials handling never stands still • See the latest developments in machines, equipment, supplies and services that will keep your plant up to date . . . save money and time. The only exposition that covers the whole range of materials handling problems • All in one place, at one time.

International Amphitheatre, Chicago, May 16-20, 1955

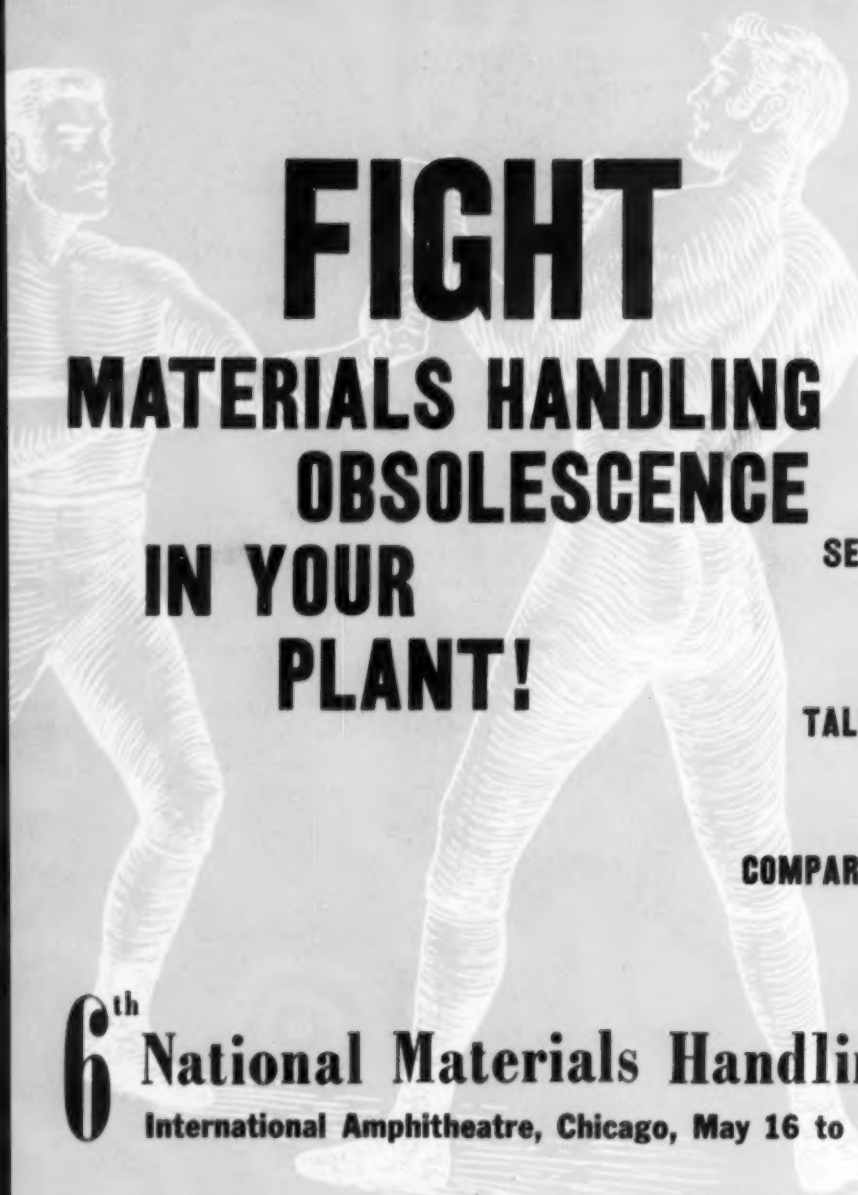
RAPID REGISTRATION

This invitation is your rapid registration card and badge. It is intended to speed your entry into the show, to avoid your waiting in line. DO NOT MAIL. See instructions reverse side.

SHOW HOURS

10:00 A.M. TO 5:30 P.M. DAILY
MONDAY THROUGH FRIDAY

CHILDREN NOT ADMITTED



FIGHT MATERIALS HANDLING OBSOLESCENCE IN YOUR PLANT!

It's been a long two years since you've had this great opportunity to see the latest developments in materials handling equipment, machines, supplies, services and methods.

Inadequate materials handling methods and equipment may be draining your profits; diverting essential skilled labor; bottlenecking your production; making your storage inefficient; slowing down shipments; killing your investment in automatic production machinery.

Right now is the time to:

SEE hundreds of exhibits by the pace-making, progressive companies who are making newly designed materials handling equipment to reduce your handling costs, and speed your production.

TALK to thousands of technical experts who will tell you how their equipment has been developed to meet the needs of modern automated production machines.

COMPARE the actual performance of all the makes of materials handling equipment you are interested in. You'll see them side-by-side.

6th National Materials Handling Exposition

International Amphitheatre, Chicago, May 16 to 20, 1955

Tear out ticket along the dotted line. Properly filled in, it will admit you to the 6th National Materials Handling Exposition. No other registration is required. For additional tickets, write to the Exposition Management, Clapp & Poliak, Inc., 341 Madison Avenue, New York 17, N. Y. There is no charge or obligation.

6th National Materials Handling Exposition

NAME _____

TITLE _____

COMPANY _____

CITY _____ STATE _____

USE TYPEWRITER. DO NOT DETACH

F

RAPID REGISTRATION

Fill in card and stub COMPLETELY. Use TYPEWRITER only. Handwritten or incomplete cards subject to delay. DO NOT MAIL CARD. Bring it to Rapid Regisfration Desk at the Exposition.

YOUR NAME _____

TITLE _____

COMPANY NAME _____

CO. ADDRESS (STREET) _____

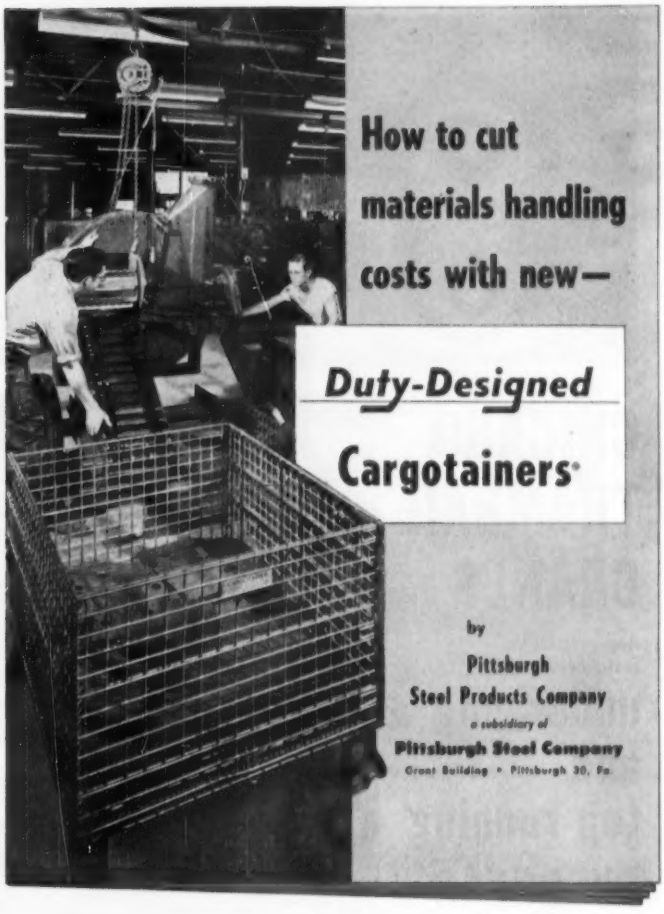
CITY _____ ZONE ____ STATE _____

COMPANY'S BUSINESS OR PRODUCT _____

YOUR HOTEL _____

LITHO. IN U.S.A.

How to Estimate Your Materials-Handling Savings With *Cargotainers*®



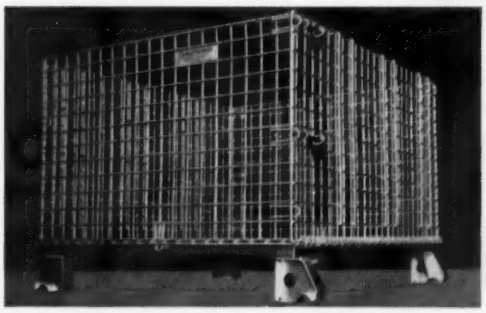
This new 24-page booklet, "How to cut materials-handling costs with new Duty-Designed Cargotainers," is packed with factual information obtained from leading manufacturers of all kinds of products. It contains actual case histories with photos showing Cargotainers at work on production lines moving all kinds of products from food, auto parts, pipe fittings to textiles. It shows the many different types of folding, stacking Cargotainers from stock models to special designs for your particular merchandise.

Send today for your free copy. It's yours for the asking.

Pittsburgh Steel Products Company

a subsidiary of Pittsburgh Steel Company

1403 Grant Building • Pittsburgh, Pa.



Gentlemen: Please send me your 24-page booklet "How to cut materials-handling costs with new Duty-Designed Cargotainers" without cost or obligation.

NAME *TITLE*

COMPANY

ADDRESS

Circle No. 131 on Reader Service Card for more information

CHICAGO TRAMRAIL CRANES

Representative installations of

underhung and top running OVERHEAD CRANES

Designed to solve your Material Handling needs . . .

Designers, engineers and builders of a wide and diversified line of overhead cranes, monorails, jib cranes and staker cranes, the Chicago Tramrail organization has an extensive, practical knowledge in materials handling problems.

Manufacturing both underhung and top running overhead cranes with capacities to 10 tons and spans to 60 feet, our Engineering Department works closely with your organization to select the exact crane which best meets your requirements, and to design and erect runways which will speed the flow of work.

ASK FOR Descriptive Catalog and Engineering Data

CHICAGO TRAMRAIL CORPORATION

1330 So. Kostner Avenue • Chicago 23, Illinois
Circle No. 64 on Reader Service Card for more information

MEN IN THE NEWS

Continued

son Corporation of New York to **Robert I. Hicks,** in order to devote his full time to the parent company.

. . . at Electric Storage Battery Co.

The board of directors elected **Carl F. Norberg** president, following the resignation of **S. Wyman Rolph** who is retiring after 38 years service. A native of Sweden, Norberg joined Willard Storage Battery Company, then a subsidiary of Exide, in 1925, and held a succession of positions.

C. F. Norberg

. . . at Borroughs Manufacturing Co.

George Bennett is now the general manager, according to an announcement by **Douglas F. Roby,** president of American Metal Products Company. Previously assistant to the vice president of production of American Metal Products Company, Bennet is a graduate of General Motors Institute and Wayne University. **Tracy Call** will continue as comptroller of Borroughs and **Joseph E. Davis** as sales manager.

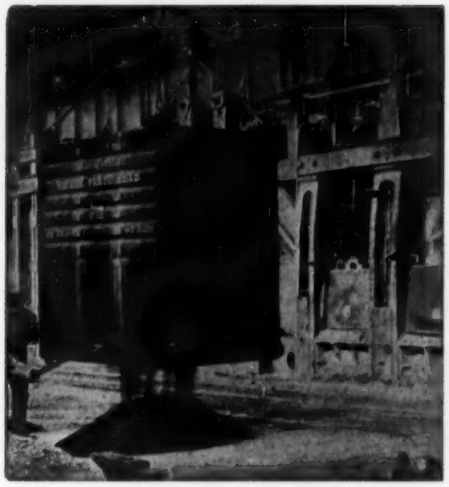
G. Bennett

. . . at General Electric Co.

Election by the board of directors of **Robert L. Gibson** as vice president was announced by President **Ralph J. Cordiner.** General manager of G. E.'s Chemical and Metallurgical Division, Gibson will continue to make his headquarters in Pittsfield, Massachusetts.

(Continued on page 121)

Know These 2 Basic Types of Youngstown Bulk Materials Containers



Discharge of bulk material from controlled discharge container.

Shut off of discharge of material.

LOOK beyond their sturdy long lasting steel bodies and discover their built-in characteristics and cost which make them a must for your plant.

ASCERTAIN how they eliminate rehandling of bulk materials from source to final disposition.

LEARN how the basic controlled discharge container enables you to discharge the quantity of material you desire and then shut off the flow by means of an easily operated gear actuated rotary valve. The gears are housed and completely protected.

DISCOVER the ease with which the discharge door on the bottom of the basic drop bottom container can be released to quickly and completely discharge the bulk materials it carries.

PERCEIVE the action of the lock which securely and automatically locks the discharge door in the closed position when the container is placed upon the ground.

DISCERN that with ordinary care these containers will reward you with many years of faithful, repair-free service, save valuable time and drastically cut your material handling costs.

RECOGNIZE the flexibility of design of these containers which enables them to be built to your specification and size. In these accomplishments we work closely with you and place the experience and know-how of our engineering staff at your disposal.

Quick and complete discharge Bulk Materials Container with Bottom Discharge Door open.

Consult with Us for Improved Handling of Your Bulk Materials

THE YOUNGSTOWN STEEL DOOR CO.

Camel Sales Company • Camel Company Limited

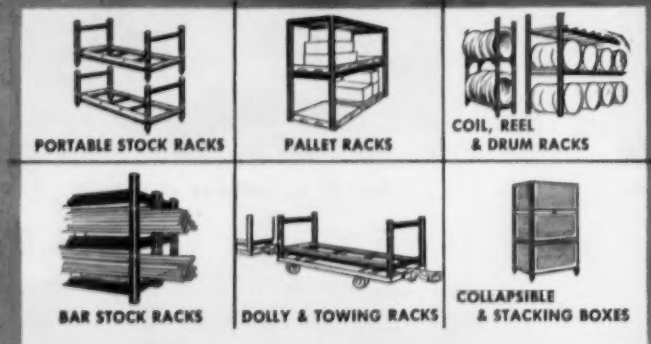
CLEVELAND • CHICAGO • NEW YORK • YOUNGSTOWN

Circle No. 52 on Reader Service Card for more information

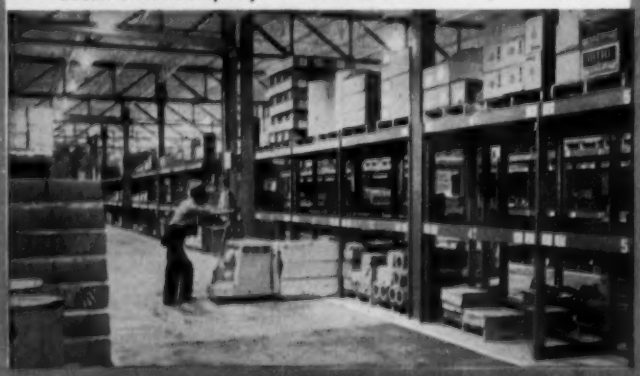
You Can stack ANYTHING on **E.M.I.** Racks

cut time and handling costs
keep your materials
well stacked!

Equipment Manufacturing storage racks that stack are fabricated of strong, square tubular steel and are adjustable to fit any space or unit load in your plant or warehouse. Special racks designed to your specifications. Field Engineering Service on any installation. Before you decide on a new warehouse, additional storage space or the purchase of stacking equipment, write for our catalog. You save money, space and time with E. M. I. racks.



E.M.I. Pallet Racks are installed at the efficient American Locomotive Company Warehouse in St. Louis, Missouri.



Write for Illustrated Catalog

EQUIPMENT MFG. INC.

21552 HOOVER ROAD • DETROIT 5, MICHIGAN

Materials Handling Equip... ...Parts for Industry

Circle No. 117 on Reader Service Card for more information

A SHIFT of emphasis will highlight the National Materials Handling Exposition which will be held May 16 to 20 at the International Amphitheatre in Chicago—a shift to emphasis on new systems for handling rather than on single types of equipment which characterized previous expositions.

Visitors to the show also can attend a conference on material handling techniques, sponsored by the American Material Handling Society and conducted by engineers who use the equipment. The conference is planned to offer users of material handling equipment the widest possible knowledge of the field. Thus, visitors will be able to supplement their inspection of equipment with discussions of case histories of handling installations in the nation's leading factories and warehouses.

Both the Society and exposition management point out that American industry is faced with a gigantic task of bringing its material handling systems up-to-date. Despite the relatively recent introduction of this equipment, they say, much of it is obsolete. So it is only natural that the theme for the show is "The Concept of Obsolescence".

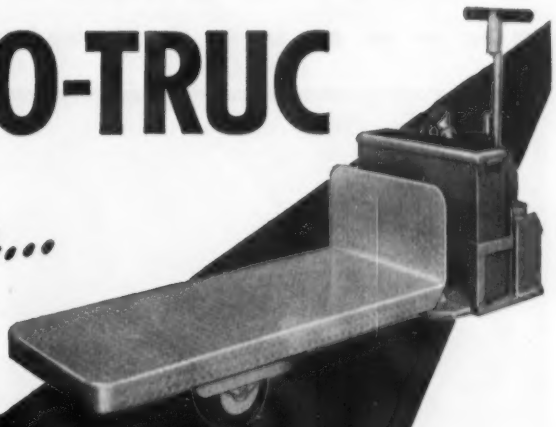
More than 200 companies will participate in the show, and their displays will cover 115,000 square feet of booth space. The range of the exhibits will be broader than at any of the five previous expositions—and the show will be the first to use the combined space of both the newly-built exposition hall and the older facilities of the International Amphitheatre.

Also coming up in May is a special issue of FLOW—one devoted to material handling and the national economy. The editors of FLOW believe this will be the most significant single issue of its kind ever published.

We think you'll agree.

COMPARE MOTO-TRUC

for...



★ MANEUVERABILITY

★ TRULY FUNCTIONAL DESIGN

★ EASE OF OPERATION

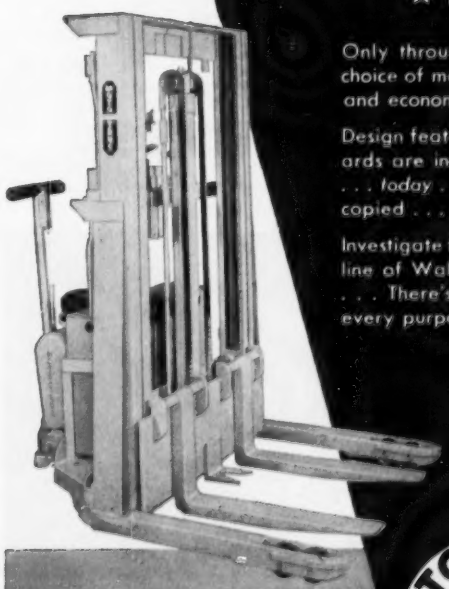
★ EASE OF MAINTENANCE

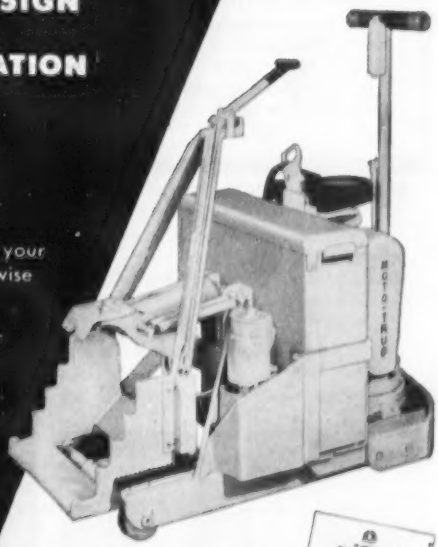
★ PRICE

Only through diligent comparison can your choice of materials handling trucks be a wise and economical one.

Design features that are *tomorrow's* standards are incorporated in MOTO-TRUCS . . . *today* . . . these features are often copied . . . yet never equalled.

Investigate the *complete* MOTO-TRUC line of Walkies . . . and remember . . . There's a MOTO-TRUC for every purpose.





Send for Bulletin #54

MOTO-TRUC Designers FOR THE INDUSTRY PATENTED

The MOTO-TRUC *Co.*

1955 EAST 59th STREET • CLEVELAND 3, OHIO

Pallet . . . Platform . . . Hi-Lift Trucks

LARGEST EXCLUSIVE MANUFACTURER OF "WALKIES"

Circle No. 138 on Reader Service Card for more information

TORTURE TESTS PROVE

BEFORE TEST

Three standard cushion-type solid tires were used in this test. The Monarch Mono-Cushion was selected from stock awaiting shipment . . . competitive tires were purchased from authorized dealers of two other leading industrial tire manufacturers.

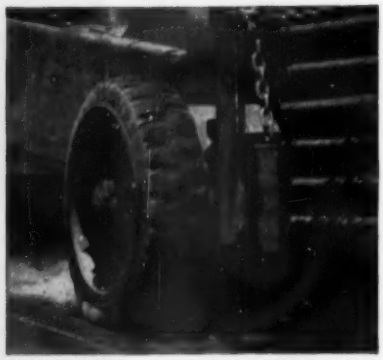
AFTER TEST

This unretouched photo shows comparative condition of same three tires after each had undergone an absolutely identical testing procedure. All tests were made the same day . . . using a constant time interval and same testing equipment.

. . . THE SUPERIORITY OF *Mono-Cushion*® INDUSTRIAL TIRES

TEST EQUIPMENT . . . a standard dual-drive lift truck carrying a loaded tote box weighing 4,864 pounds. Deliberate overload of approximately 44% created by mounting a single 22x6x16 cushion tire on each drive wheel (which normally carries dual tires of this size). Overload increased severity of test and accelerated tire fatigue.

TEST PROCEDURE . . . loaded truck was operated continuously at maximum speed for a fixed time interval. Truck's brakes were jammed on periodically throughout testing period to cause sudden stops and create extreme shock loads.



TEST TRACK . . . was a combination of black top and gravel road surfaces to simulate severe operating conditions (for both indoor and outdoor applications). A railroad spur in the plant yard was included in the test pattern.

Circle No. 20 on Reader Service Card for more information

HERE ARE THE FACTS

THAT MEAN SAVINGS TO YOU

(1) ONLY MONO-CUSHION SURVIVED THE TEST . . . the other tires were too damaged for normal use. TIRE "A" lost a section of tread 6 inches long and 1 inch deep. TIRE "B" was badly chipped and had two deep splits that reached almost to rim. This is additional proof that *Mono-Cushion is a better buy . . . it costs less initially and lasts longer.*

(2) MONO-CUSHIONS GIVE YOU MORE TON-MILES PER DOLLAR . . . because the rubber stocks developed especially for these tires are compounded from *higher quality materials than are used in the best "premium" passenger car tires.* This is no idle claim. It is another fact previously known only by Monarch's key personnel.

(3) MONARCH SUPPLIES PERFORMANCE-PROVEN INDUSTRIAL SOLID TIRES. Working closely with lift truck manufacturers, Monarch engineers have created tire and tread designs that assure maximum cushioning action for vehicles, loads, floors and drivers. A leading supplier of pressed-on tires, Monarch has a type and size to meet every lift truck requirement.

WHEN YOU NEED TIRES, REMEMBER MONARCH . . . THE KING OF THE SOLIDS

YOUR NEAREST MONARCH TIRE DEALER is listed in the Yellow Pages under "Trucks-Industrial-Parts & Supplies" or "Tires-Industrial". If current directory does not have a listing, write direct for complete catalog and name of nearest dealer.

THE MONARCH RUBBER COMPANY

2003-MR

210 Lincoln Park • Hartville, Ohio

7-255 General Motors Bldg., Detroit 2, Mich.

Calendar of Events

March 3

8th Quebec Regional Conference,
Packaging Association of Canada,
Sheraton-Mount Royal Hotel,
Montreal, Quebec

March 14-18

Western Industrial Exposition,
Shrine Auditorium and Exposition Halls,
Los Angeles, California

March 28-29

American Institute of Electrical Engineers, Technical Conference on Overhead Cranes,
Cleveland Hotel,
Cleveland, Ohio

April 6-10

World Plastics Fair & Trade Exposition,
National Guard Armory,
Exposition Park,
Los Angeles, California

April 14

Material Handling Institute,
Carter Hotel,
Cleveland, Ohio

April 18-21

24th National Packaging Exposition,
International Amphitheatre,
Chicago, Illinois

April 19-21

Caster & Floor Truck Mfgrs. Assoc.,
Edgewater Beach Hotel,
Chicago, Illinois

May 16-20

6th Annual National Material Handling Exposition,
International Amphitheatre,
Chicago, Illinois

May 19

5th Ontario Regional Conference,
Packaging Association of Canada,
Walper Hotel,
Kitchener, Ontario

May 31-June 3

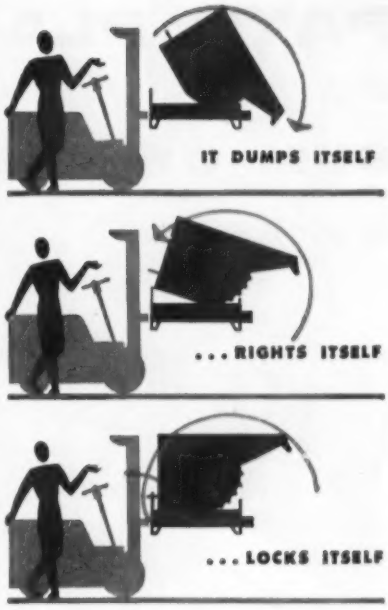
Design Engineering Show
Convention Hall,
Philadelphia, Pa.

June 19-July 2

Material Handling Training Conference,
Lake Placid, New York

July 12-14

Western Plant Maintenance Show,
Pan Pacific Auditorium,
Los Angeles, California



and lives a long and useful life

Not only do Roura Self-Dumping Hoppers cut handling and unloading costs of wet or dry, hot or cold bulky materials 50% or more . . . they do it year after year with little maintenance or repair. That's because Roura Self-Dumping Hoppers are engineered to take "hard knocks" . . . extra heavy gauge metal . . . sturdy arc-welded joints . . . perfect balance for smooth and rhythmic operation.

The rugged Roura gives you simple one-man semi-automatic operation. Models to fit any standard fork or platform lift truck. Also available mounted on live skids, or with malleable or rubber tired wheels or casters. Sizes range from ½ to 2 cubic yards.

ROURA *Self-Dumping* **HOPPER**

WANT MORE DETAILS on how you can save money with Roura? Just clip this coupon . . . attach it to your letterhead . . . sign your name . . . and mail to

ROURA IRON WORKS, INC.
1411 Woodland Ave., Detroit 11, Michigan

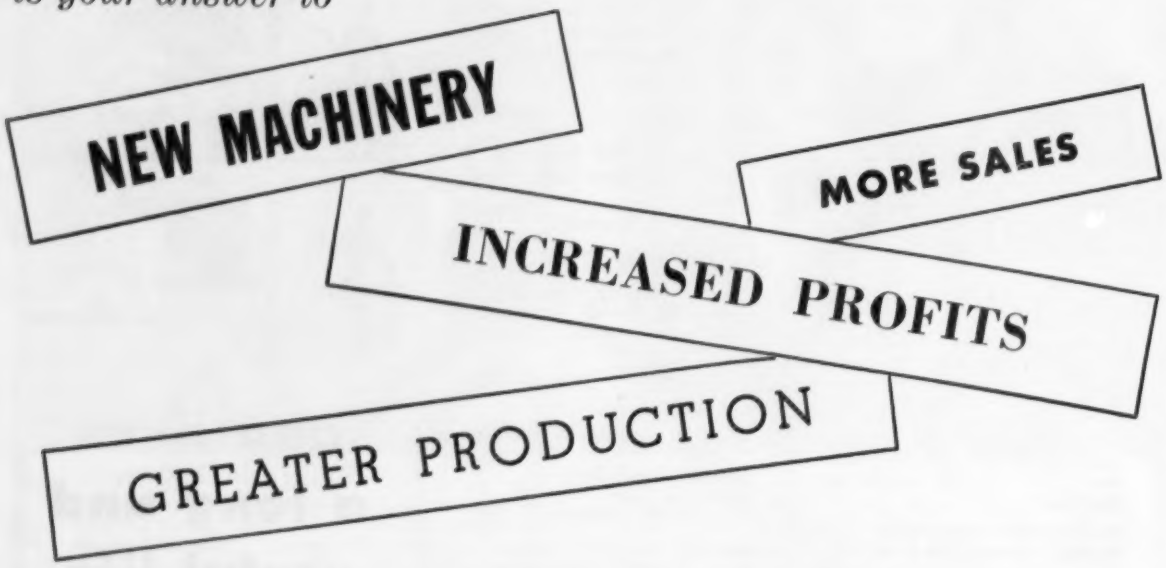
Circle No. 4 on Reader Service Card

PAYD* PLAN

and

SUM-OF-THE-DIGITS DEPRECIATION

is your answer to



Production planners cry for new machinery. Sales competition makes it vital. Equipment obsolescence threatens your profits.

C.I.T. Corporation's *Pay-As-You-Depreciate Plan helps you finance new machinery—satisfies your production people—meets your sales competition—increases your profits.

PAYD PLAN was built around the fastest permissible depreciation method: "Sum-of-the-Digits." It sets up installment payments which match your depreciation allowances as closely as possible. In effect you write off new equipment payments as expense.

Additional advantages: You make a minimum initial cash outlay. You enjoy long terms. You benefit by acquiring new profit-making equipment immediately.

PAYD PLAN is solving equipment purchase problems and making new profits possible in many industries. It covers such categories as machine tools, material handling equipment, construction equipment, and machinery used in the textile, printing, packaging, dairy and bakery fields.

Terms range from six to ten years. The PAYD PLAN charge is 4.25% for each year of the term, computed on the original unpaid balance.

New PAYD PLAN folder describes how you can put new machinery to work right away. Just write, we'll send it without obligation.

C.I.T. CORPORATION

The Wholly-owned Industrial Financing Subsidiary of C.I.T. Financial Corporation
Capital and Surplus over $200,000,000

DIVISIONAL OFFICES

Atlanta 66 Luckie Street, N.W. Cypress 8621	Cleveland 750 Leader Building Main 1-4824	Kansas City 210 West Tenth Street Baltimore 3551	Memphis 8 North Third Street Memphis 5-6795	Philadelphia 1530 Chestnut Street Rittenhouse 6-8180
Chicago 221 N. LaSalle Street Randolph 6-8580	Houston 1100 E. Holcombe Blvd. Lynchburg 3921	Los Angeles 416 W. 8th Street Michigan 9873	New York 390 Fourth Avenue Murray Hill 3-6400	Portland, Ore. Equitable Building Capitol 9721

San Francisco—660 Market Street—Yukon 6-5454

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FACTS ABOUT Exide®

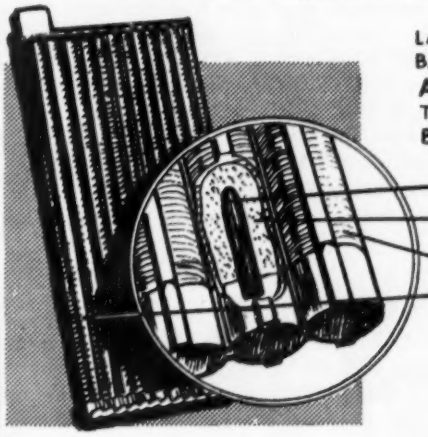
IRONCLAD® INDUSTRIAL TRUCK BATTERIES

GET MORE LIFTS EACH SHIFT ...WITH LOW COST EXIDE IRONCLAD POWER!

RAPID, ACCURATE HANDLING, PRECISE SPOTTING ARE MAJOR COST SAVING ADVANTAGES OF USING EXIDE-POWERED LIFT TRUCKS. THEY RESPOND INSTANTLY TO ANY POWER NEED. THE LARGE RESERVE POWER OF EXIDE-IRONCLADS KEEPS TRUCKS WORKING FULL SHIFTS... WITH NO COSTLY UNSCHEDULED DOWN TIME!

BATTERIES ARE WORKED TO DEATH BY EXIDE ENGINEERS TO LEARN SECRETS OF LONGER LIFE

SINCE 1910, RESEARCHERS HAVE GREATLY IMPROVED EXIDE-IRONCLAD PERFORMANCE AND USEFUL WORKING LIFE, BUT THE BASIC IRONCLAD PRINCIPLE OF TUBULAR CONSTRUCTION REMAINS THE SAME.



LAB TESTS OF IRONCLADS AGAINST CONVENTIONAL TYPES OF BATTERIES SHOW THAT THEY GIVE BETTER PERFORMANCE... AND FROM 20% TO 30% LONGER LIFE! THESE TWO FACTS, DEMONSTRATED BY THOUSANDS OF BATTERY USERS, ARE THE REASON WHY...

EXIDE-IRONCLADS ARE YOUR BEST POWER BUY **AT ANY PRICE!**

LET EXIDE HELP SOLVE YOUR INDUSTRIAL TRUCK BATTERY PROBLEMS ❶ CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS ❷ WRITE FOR FORM 1982, A MANUAL ON INSTALLING AND MAINTAINING MOTIVE POWER BATTERIES

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

Circle No. 184 on Reader Service Card for more information

in Equipment

Summaries of latest information from manufacturers. For more details, use the free-mailing Reader Service Card.

Close-Quarters Unit

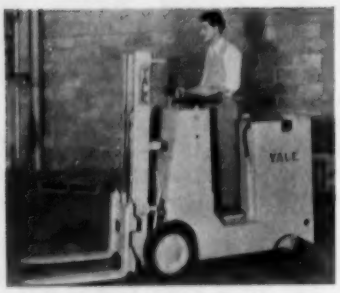
The Tug-Bar is a product of South Western Gear Works and is especially designed for close-quarter operation. Crated, skidded or wheeled loads are pushed or pulled by means of traction applied to the powered front wheels. The load is moved by leverage applied to the handle and the resultant weight on the lip. The unit is available in 110 volts ac or 24 volts dc. It will move loads up to 4000 pounds and may be operated wherever there is room for a man to stand.

Circle No. 200 on Reader Service Card for more information

Diverts From Live Roller

Trav-A-Spur is a movable spur and diverting rail manufactured by Metzgar Conveyor Company as a single unit to travel the entire length of live roller conveyor. Ball bearing throughout, the unit travels on rails mounted on each side of the live rollers and its discharge end is mounted on caster wheels. It finds application in wholesale and warehousing operations and for feeding production work to assembly, inspection and packaging lines.

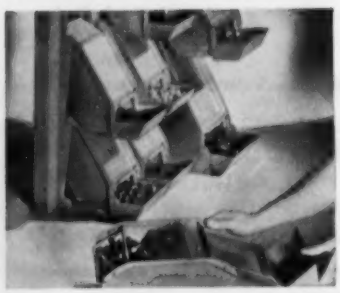
Circle No. 201 on Reader Service Card for more information



Stand-Up Drive Truck

The operator can quickly mount or dismount from either side of Yale & Towne Manufacturing Company's new stand-up drive Model K-46 electric fork truck. Available in 2000, 3000 and 4000 pound capacities, the truck will maneuver a 10 percent grade loaded, and has a top speed of 5 mph. Slightly under 28 inches in width, it will right angle turn in a 58 inch aisle and features five degrees forward and ten degrees backward tilt. Controls are located near the steering wheel for easy operation and brakes are dead-man type.

Circle No. 202 on Reader Service Card for more information

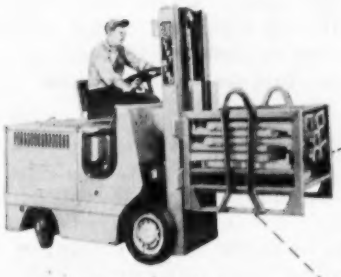


More Efficient Parts Handling

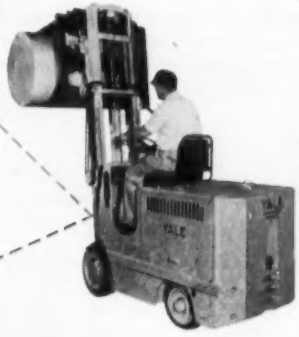
A new rack and lid combination that converts standard NesTier material handling boxes into small parts hoppers for use in assembly and production operations is being manufactured by The Chas. Wm. Doepke Manufacturing Co., Inc. Designated Hopper Rack, the unit eliminates rehandling of parts at assembly area, provides a constant supply of readily accessible parts at worker's fingertips, and permits rapid replacement of empty units.

Circle No. 203 on Reader Service Card for more information

Q. HOW MANY TRUCKS HERE?



YALE Electric Truck *with basic forks performs a host of routine handling jobs like this.*



Clamping attachment simplifies handling of large, bulky units or fragile containers. There are other YALE attachments for handling any type material.

Revolving attachment on same YALE Electric Truck handles huge paper rolls or drums with ease, stacks them flat or up-ended.

A. ONE! A SINGLE YALE TRUCK DOES THESE 3 JOBS AND MORE

Take a YALE Truck...add interchangeable YALE attachments...and you can handle a variety of lifting, stacking and moving jobs every day! What's more, you'll handle them faster, safer and at less cost. Job-specified YALE attachments—installed in minutes, removed as easily—perform dozens of specialized handling jobs...are designed for use with every Truck in the complete YALE line.

Thus, you may select just the equipment you require for your operations from the world's widest range of Electric Trucks; Gas, Diesel and LP-Gas Trucks and use-extending attachments. For full information about these dependable, economical, longer-lasting industrial tools, send coupon today!

YALE* INDUSTRIAL LIFT TRUCKS AND HOISTS

*REG. U. S. PAT. OFF.

Gas, Electric, Diesel & LP-Gas Industrial Trucks • *Worksavers*
Warehousers • Hand Trucks • Hand & Electric Hoists

MAIL THIS COUPON TODAY

The YALE & TOWNE Manufacturing Co., Dept. 43
Roosevelt Boulevard, Philadelphia 15, Penna.

☐ Please have your local representative call.
☐ Please send me further information on YALE Trucks and attachments.

Company_____

Name_____ Title_____

Street_____ City_____ State_____

In Canada write: The Yale & Towne Manufacturing Co. St. Catharines, Ontario, Canada

Circle No. 51 on Reader Service Card for more information

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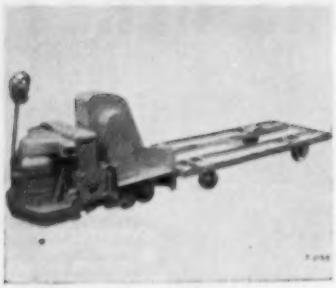


Trailer Couples Without Adaptor

An operator-led tractor that couples with industrial trailers in two seconds is available from Automatic Transportation Company. Said to be the only one of its kind that will couple to any trailer without using special adaptors, quick coupling is accomplished by a hydraulically-operated draw bar governed by a single button in the operating handle. Draw bar pull is 175 pounds normal and 800 pounds ultimate, and maximum trailer load is 6000 pounds.

Circle No. 204 on Reader Service Card for more information

Portable Unit Lowers or Lifts

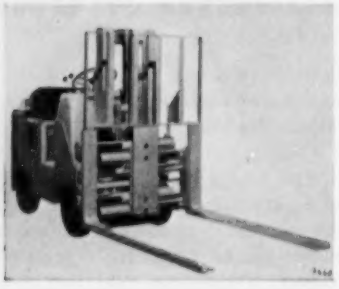
Standard Conveyor Company has adapted its standardized line of utility belt conveyors to portable use. Units are available with adjustable wheel support on the drive end and a pad support on the other end. Other portable and fixed support arrangements are also available to meet various requirements of usage. Individual units can be used to elevate or lower materials from dock to truck or from floor to stack, and can be integrated with other conveyor systems.

Circle No. 205 on Reader Service Card for more information

Designed For Savings

The Towliner, a conveyor type truck designed to reduce time in handling, dispatching and sorting, is available from Towsley Trucks Inc. It has an all-welded steel frame, hardwood deck, and may be equipped with either six- or eight-inch molded-on rubber wheels. A securely mounted blackboard makes load marking easy, and there's a handy holder for load check cards. A pin mounted on the front tow-plate attaches to the conveyor system for a continuous mobile operation.

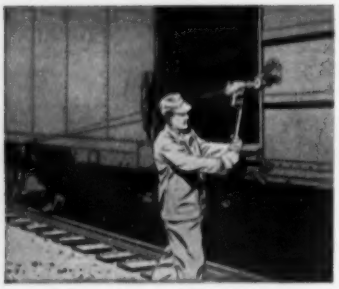
Circle No. 206 on Reader Service Card for more information



Better Tire Handling

Towmotor Corporation has developed a new type fork accessory to increase the efficiency of rubber tire handling. The unit will handle pallet and skid loads, in addition to its primary function of handling loads of tires of varying sizes without pallets or skids. It consists of special hydraulically adjustable and beveled forks that can pick up a stack of tires mechanically. The slanted fork edges help cradle the load for transporting, stacking or loading. Maximum fork spread is 76 inches.

Circle No. 207 on Reader Service Card for more information



A Quick Opener

A car door puller with a capacity of 3000 pounds, a reach of 27 feet, and which weighs only 12½ pounds, is the latest product of The Lug-All Company. The puller will open box car doors safely, quickly and economically, according to the manufacturer, and is pre-tested to 100 percent overload. It may be rigged by single cable for extra long reach or double cable to provide extra power on really tough car doors.

Circle No. 208 on Reader Service Card for more information

(Continued on page 173)

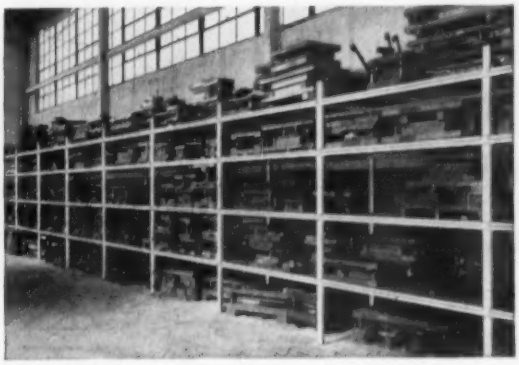
"Stack up" with

here's an exclusive American feature

American STORAGE RACKS

When you "stack up" with American Tubular Storage Racks, you also "stack up" savings. The ingenious and simplified American feature, "erected without bolting or welding," has made them first choice with many businesses both large and small. American Racks are designed to meet practically every storage need. Send for catalog and get the facts on American before you buy any type of rack.

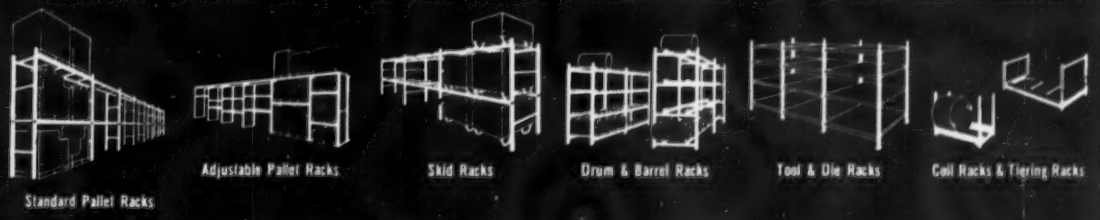
Die Storage Rack installation at Athens Stove Works, Athens, Tenn.



Die Storage Rack installation at Detroit Engineering & Machine Co., Detroit, Mich.

send for catalog

There's an American Rack for every storage need



among those sold on American are:

A. C. Spark Plug Division
Anheuser-Busch, Inc.
B & O Railroad Co.
Carnegie Illinois Steel Corp.
Chevrolet Motor Division
Chrysler Corp.
Cities Service Oil Co.
Colgate-Palmolive Co.
DuPont de Nemours & Co., Inc., E. I.
Ford Motor Co.
General Electric Co.
Goodrich Company, The B. F.
Heinz, H. J., Company, Inc.
Kroger Company, The
Radio Corporation of America
Rexall Drug Co.
Sherwin-Williams Co.
Socony-Vacuum Oil Co., Inc.
Standard Brands, Inc.
U. S. Atomic Energy Commission
U. S. Steel Co.
F. W. Woolworth Co.

AMERICAN METAL PRODUCTS CO.

STORAGE RACK DIVISION
5959 Linsdale • Detroit 4, Michigan

Circle No. 91 on Reader Service Card for more information

MATERIALS-HANDLING NEWS

★ Panel Discussions by Bassick, World's Largest Manufacturer of Casters and Floor Protection Equipment ★

Simple file test proves proper swivel bearing hardness

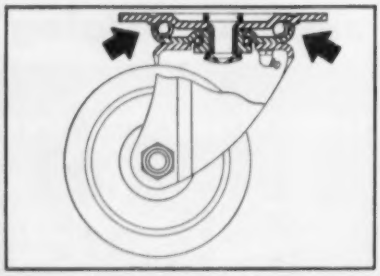
Hard? Filing action fails to cut uniformly hard (15N90 Rockwell) bearing raceway surface — showing you get *more-for-the-money* service life when you specify Bassick double ball-bearing cold-formed steel casters.

File-hard bearing surfaces

Bassick's deep full case-hardening process employs Leeds & Northrup electrically controlled "Homocarb" furnaces to assure "file-hard" ball and raceway surfaces of uniform depth and value of hardness. This eliminates premature wear or failure of these vital swivel bearing parts of all cold-formed double ball-bearing steel casters.

Try this simple file test in comparing the caster you are now using with a Bassick cold-formed double ball-bearing steel caster (series H99, S99, 68, H68, etc.). More-for-the-money service life is assured since Bassick's "file-hard" bearing surfaces are highly resistant to wear or damage.

Cross-section shows location of case-hardened parts



All surfaces of swivel bearing parts are full case-hardened *all over* — note heavy lines. Unlike so-called "coin-hardening" or its synonym "work-hardening", which reflects only a change in metal density as a by-product of cold forming metal processes, Bassick's controlled hardening process after forming provides completely uniform hardness depth and "file-hard" (15N90 Rockwell hardness) surface value.

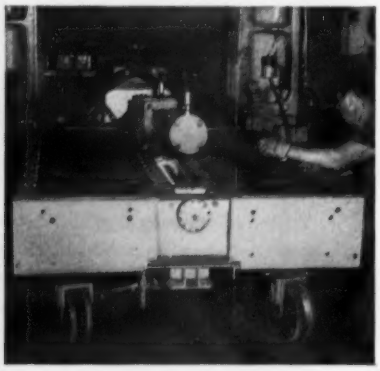
Full case-hardened and cupped raceways give you longer service

On light-duty trucks and dollies, series "68" caster gives easy action. Load ratings up to 800 lbs. per truck.

Shop trucks and mobile equipment move easier on new low-cost series "H68" caster for loads up to 1400 lbs.

For medium and light-duty jobs, use rugged series "H99" caster with load ratings up to 4000 lbs. per truck.

No "man-handling" here



Tired of wrestling with heavy dies?

Take a tip from Fairchild Aircraft, which built this hydraulic die wagon and equipped it with Bassick grooved-wheel casters. They're the best solution yet to the problem of moving materials frequently over a fixed route.

Accurate Control

This ingenious wagon employs hydraulic power to place and remove press dies. It completely eliminates laborious manhandling with the help of chain falls and skids. Bassick grooved-wheel casters permit accurate control of wagon, make movement 3 times easier than flat wheels in direct contact with floor. They roll on easily installed angle iron track which is inexpensive and self-cleaning. They're made in both swivel and rigid types, with wheel diameters of 4″, 6″, 8″ and 10″.

Write for facts

We'll be glad to supply more data on the Bassick products you see here. Bassick makes the world's largest line of casters, assuring you the right type for any moving job. Check your Bassick industrial distributor or write us direct.

THE BASSICK COMPANY
Bridgeport 2, Conn.
In Canada:
Belleville, Ont.

Bassick A DIVISION OF STEWART SW WARNER

MAKING MORE KINDS OF CASTERS . . . MAKING CASTERS BY MORE

75 YEARS OF CASTER LEADERSHIP

Circle No. 17 on Reader Service Card for more information

This new frame is new only to lift trucks. It's the first major change in the field in 50 years! It's exclusive with Buda and it gives added strength, permits more flexibility.
Rugged steer axle gives stability, permits equalization over rough floors.
Double universal-slip joint construction eliminates torsional strains.
Exclusive lateral adjustment on carriage to reduce any play.
One piece double reduction construction doubles axle life.
BUDA

BUDA

LIFT TRUCK IS THE MOST RUGGED IN THE FIELD!

HERE'S FREE PROOF
. . . one of the most interesting and profitable books on materials handling you've seen. Send for your free copy today!

The structural strength of a vehicle is based on its frame. So Buda designed an automotive-type frame—revolutionary in the lift truck field. There are no nuts and bolts to jar and jolt loose. Joints are high strength steel welds. Longitudinal members are high carbon steel specially rolled flanged members with high load carrying points reinforced and gussetted. All stress and shock loading are effectively absorbed. Next came the mast . . . precision designed to out-perform and outlast all others. A high carbon steel specially rolled channel section, the mast is completely welded into a rigid, permanent unit structure. Buda engineers followed through on every part of the new truck . . . building strength, durability and long life into the most rugged lift truck in the field . . . Buda!

THE BUDA DIVISION
Allis-Chalmers Manufacturing Company
Harvey, Illinois

Circle No. 36 on Reader Service Card for more information

HYDRAULICS FOR MOBILE EQUIPMENT
VOL. 2

Mobile Equipment News

VICKERS INCORPORATED, DETROIT, MICHIGAN

IMPROVES PERFORMANCE • CUTS COSTS
NO. 4

VICKERS® VT16 PUMP NOW AVAILABLE FOR HYDRAULIC POWER STEERING OF TRUCKS AND MATERIALS HANDLING VEHICLES

The Vickers Series VT16 pump is used more widely than all other makes combined for the power steering of automobiles. It is now available for the first time for the hydraulic power steering of trucks and materials handling vehicles. It has all the characteristics important to this service and is used in a separate hydraulic circuit for steering only.

COMPLETE PACKAGE

Series VT16 has integral volume control valve and relief valve . . . also an integral oil reservoir. This is a complete hydraulic power package for steering.

SIMPLIFIED INSTALLATION

This compact and complete power package is easily and quickly installed. All you need to do is bolt it on, make two hydraulic connections, and couple the power.

LONGER PUMP LIFE

The exclusive Vickers "Hydraulic Balance" eliminates pressure-induced bearing loads and the consequent wear. These lighter bearing loads mean much longer bearing and pump life.

NO LOAD STARTING

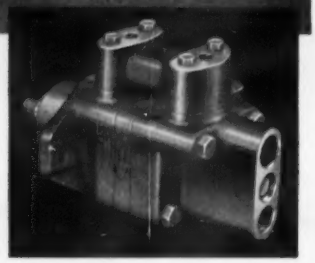
At rest and normal starting speeds, the sliding vanes are retracted; only after engine fires do vanes extend and pumping begin.

ASK FOR BULLETIN M-5104A

Series VT16 Vickers Pump with integral volume control and relief valves and oil reservoir. For hydraulic power steering.

HIGH OPERATING EFFICIENCY

The vane type construction, hydraulic balance and automatic maintenance of optimum running clearances enable these pumps to deliver more oil with less power. This high operating efficiency is maintained throughout the long pump life.



Series VT17 Vickers Pump is similar to the VT 16 except that it does not include the oil reservoir.

VICKERS Incorporated
DIVISION OF THE SPERRY CORPORATION
1538 OAKMAN BLVD. • DETROIT 32, MICH.

Application Engineering Offices: • ATLANTA • CHICAGO AREA (Brookfield) • CINCINNATI • CLEVELAND • DETROIT HOUSTON • LOS ANGELES AREA (El Segundo) • MINNEAPOLIS • NEW YORK AREA (Summit, N. J.) • PHILADELPHIA AREA (Media) • PITTSBURGH AREA (MT. Lebanon) ROCHESTER • ROCKFORD • SAN FRANCISCO AREA (Berkeley) • SEATTLE • ST. LOUIS • TULSA • WASHINGTON WORCESTER

VICKERS® HYDRAULIC POWER STEERING BOOSTER

EFFORTLESS • POSITIVE • SHOCKLESS

6726

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

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B.F.Goodrich

TW ANALYSIS solves costly tire problem for Aluminum Smelting Company of Cleveland

Cutting and chipping, caused by oil and aluminum scrap, created a problem for Aluminum Smelting Company. The B. F. Goodrich Tire and Wheel Analysis man solved this problem.

Aluminum Smelting Company converts scrap aluminum to ingots. Here an industrial truck carries a load of ingots from the smelting furnace to the shipping department.

CUTTING and chipping of industrial tires, caused by aluminum scrap and oil, created an expensive problem for Aluminum Smelting Company of Cleveland. The tires on this company's fleet of 11 industrial trucks were being "chewed to pieces" after only a week or two of service.

The local B. F. Goodrich Tire and Wheel Analysis man was asked to make a study of the problem. As a result of his findings, BFG Pressed-On Deluxe Cushion tires were installed on all of the trucks. BFG's All-Purpose compounding was specified to provide resistance against oil damage and cutting and chipping.

Here's what Mr. Steve Robusky, Maintenance Superintendent of Aluminum Smelting, has to report—"These BFG tires have helped us eliminate cutting and chipping. Damage from oil has been eliminated almost completely. We have realized substantial savings in tire costs and maintenance expense."

FREE TW ANALYSIS CAN SOLVE YOUR PROBLEM

The B. F. Goodrich Tire and Wheel Analysis is a free service. Just contact your local B. F. Goodrich retailer or mail the coupon below. Without cost or obligation, a trained BFG man will study your materials handling operations. His recommendations can help you cut industrial tire costs . . . reduce maintenance expense. The advice you receive will be unbiased, for B. F. Goodrich makes a *complete* line of industrial tires for every type of service. A special TW Analysis is available for manufacturers of industrial equipment.

Specify B. F. Goodrich tires when ordering new equipment

The B. F. Goodrich Company
Tire & Equipment Division
Department TW-488, Akron 18, Ohio

Please send me:

- ☐ Additional information on your Tire and Wheel Analysis Plan
- ☐ Free copy of "Industrial Tire Guidebook"
- ☐ Free copy of "How to Get Extra Service out of Solid Industrial Tires"

Name_____

Company _____

Street _____

City _____ Zone_____ State_____

Circle No. 153 on Reader Service Card for more information

HERE'S WHAT TO LOOK FOR

when you're buying a hand pallet truck

MODEL L2P
Capacity 2,000 lbs.

WELDED IN ONE PIECE... head, shoulders and forks. No weak spots.

POLISHED PUMP PISTON plus 7 packings to insure permanent oil seal.

3 GRADUATED BOOSTER ROLLS to provide easy pallet entry.

POLISHED ELEVATING RAM and long-lived packings to prevent oil leakage.

HEAVY DUTY SPRING to hold handle in upright position.

SMOOTH BRAKE PAD to prevent damage to floors.

RUBBER-TIRED FRONT WHEELS ... Bigger, wider ... for easy rolling and floor protection.

RAYMOND

Lightweight **HAND PALLET TRUCK**

... has all these ... and more. Lightweight . . . thanks to aluminum alloy construction. Rugged, yet easy to pull. Foot pedals lift and lower your load.

CLIP & MAIL COUPON!

The RAYMOND CORPORATION
3353 Madison St., Greene, N. Y.

☐ Send catalog, showing Hydraulic Hand Trucks.
☐ Please have your representative call.

NAME _____ TITLE _____
COMPANY _____
STREET _____
CITY _____ STATE _____

Circle No. 48 on Reader Service Card for more information

association and society NEWS

• **Incoming president** of The Industrial Truck Association is C. W. Henkle, president, The Mercury Manufacturing Company. Vice president of the group is J. A. Baldinger, general manager of Automatic Transportation Company. The association maintains national headquarters in Washington, D. C., where secretary-treasurer Wm. Van C. Brandt is the managing director.

• **The Material Handling Institute, Inc.** recently elected three men to head the College-Industry Committee on material handling education. Byron W. Saunders, associate professor at Cornell University is chairman of the group. Howard M. Palmer, vice president of Lewis-Shepard Products, Inc. and George A. Smith, manager of material handling, International Business Machines Corporation, will serve as vice chairmen. Palmer is a past president of the Material Handling Institute and Smith is past president of the American Material Handling Society.

• **Officers installed** at the annual meeting of the Power Crane and Shovel Association were President Walter W. Walb, Wayne Shovel and Crane Division, American Steel Dredge Co., Inc.; Vice President D. W. Lehti, Link-Belt Speeder Corporation; and Secretary and Counsel Herbert S. Blake, Jr. of New York City. The board of directors, in addition to Walb, includes Owen P. Dulude, Bay City Shovels, Inc.; W. L. Schield, Schield Bantam Company; D. H. Ross, Clark

Equipment Company; F. Salditt, Harnischfeger Corporation; F. W. Zimmer, Manitowoc Engineering Corporation; and J. P. Courtright, Marion Power Shovel Company.

• **The Third Workshop Seminar** on material handling will be conducted by the Montreal Chapter of the American Material Handling Society at the Windsor Hotel in Montreal, March 9-10. Discussion groups, consisting of approximately 20 persons under the guidance of a group chairman, will cover topics planned to give participants a working knowledge of the latest material handling techniques. E. Dupre, Northern Electric Company, Ltd., is chairman of the seminar committee.

• **The Cleveland Chapter** of the American Material Handling Society toured the new Cleveland Post Office in February. Later, at a dinner meeting, they heard a talk by M. J. Anderson, of the Post Office Department, Washington, D. C., on material handling practices.

• **The spring meeting** of the Foundry Equipment Manufacturers Association, Inc. will be held at the Sheraton-Carlton Hotel, Washington, D. C., on April 15. An important feature of the meeting will be a discussion on material handling and processing.

• **Speaker** at the February meeting of the Northeastern Ohio Division of the Society of Industrial Packaging and Material Handling Engineers was Andrew J. Briggs, whose subject was, "A Practical Approach to Storage Layout Planning and Stock Location". Briggs is head of the Material Handling and Warehousing Branch of the Storage Division, Bureau of Supplies and Accounts, Navy Department.

(Continued on page 124)

for men responsible for materials handling

A revolution has taken place in the materials handling field. With the advent of electric trucks designed for narrow-aisle operation a whole new concept of handling has evolved.

Here . . . in this new RAYMOND Catalog . . .are the trucks responsible for this revolution. These are the trucks which first made 6-ft. warehouse and production aisles possible . . . which today are increasing warehouse storage capacity as much as 50%. As you glance through this catalog, you'll discover how you can open up to electric truck service areas previously approachable only by hand truck. For example: your elevators, low-capacity floors, warehouse and production floor aisles, boxcars, truck trailers.

You owe it to yourself and your business to obtain this RAYMOND Catalog before buying or leasing an electric truck. Clip and mail the coupon now!

RAYMOND

ELECTRIC INDUSTRIAL TRUCKS
HYDRAULIC ELEVATING EQUIPMENT

SEND FOR YOUR FREE COPY!

The RAYMOND CORPORATION

3348 Madison St., Greene, N.Y.

Please send me your new Electric Industrial Truck Catalog.

NAME _____ TITLE _____

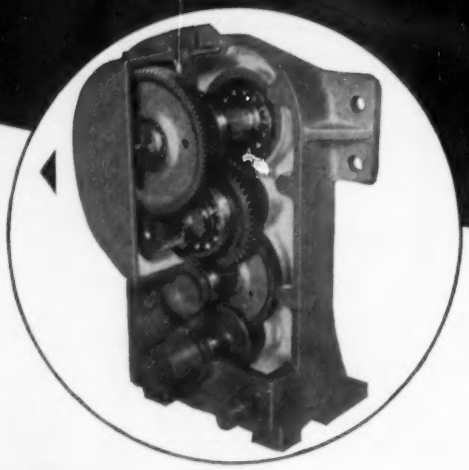
COMPANY _____

STREET _____

CITY _____ STATE _____

Circle No. 49 on Reader Service Card for more information

NEW... AMERICAN MONOTRACTOR for Automatic Handling



The NEW American MonoTractor will fit precisely into any overhead handling system for automatic transfer of materials.

This new unit offers these advantages:—

1. Duti-Rated Life Time Gearing.
2. Speed Range from 35 to 350 F. P. M.
3. Horsepower Range for ¼ to 2 H.P.
4. Any Standard NEMA Motor.
5. Any Type Motor Brake Can Be Applied.
6. Operates on Any Smooth Flat Flange Track.

This precision built tractor unit offers continuous trouble-free transfer of any type of carrier for power propulsion. American MonoRail engineers offer wide experience in the application of these units. Let them help you solve your automatic handling problems.

AMERICAN OVERHEAD HANDLING EQUIPMENT

AMERICAN MONORAIL COMPANY

13129 ATHENS AVENUE • CLEVELAND 7, OHIO

[IN CANADA—CANADIAN MONORAIL CO., LTD., GALT, ONT.]

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"PALITON"

The proved COST-CUTTER

with all the advantages

Low Cost—Long Life—
Least Maintenance.

●

Five Inch Hydraulic Lift.

●

Threeway Control for
Raise, Lower and
Neutral Giving Free
Handle for Towing.

●

Overloading Prevented
By Pre-Set Relief Valve.

●

Capacities 3,600 and
4,600 lb.
Fork Lengths 36"-42"-48"
Widths 20½" and 27"
Specials to Order.

●

*STOCKS AND SPARES
HELD BY ALL OFFICES*

●

**WRITE FOR ILLUSTRATED
LITERATURE:**

**The Paliton Hand Pallet
Truck**

Photograph by courtesy of Frigidaire Division of General Motors Ltd.

HEAD OFFICE:
OMIC, Ltd.,
7 George St.,
London, W.1. England

CANADIAN OFFICE:
c/o CONVEYANCER,
18 Ingram Drive at Keele Street,
P.O. Box 14, Station D,
Toronto, Ont., Cherry 7-1881

NEW YORK OFFICE:
PALITON, Inc., 40 West 29th St., New York 1, N.Y., Murray Hill 5-9321

Circle No. 93 on Reader Service Card for more information

Literature

featured in this month's advertisements

It's Rugged: The most rugged lift truck in the field is Buda, claims The Buda Division of Allis-Chalmers Manufacturing Company. The manufacturer offers to prove the point.
Circle 36 on Reader Service Card

A Reality: RCA 2-way radio makes efficient "Automotive Pool" a reality at Socony-Vacuum Oil Company, says Radio Corporation of America. They invite you to read how.
Circle 47 on Reader Service Card

No Big Deal: It's simple for your own men to install Coburn Products' overhead conveying equipment, according to the manufacturer, who outlines the ABC's of the installation.
Circle 99 on Reader Service Card

Cost Cutter: New London Engineering Company says its conveyors are light, versatile cost cutters for boxes, bags, bundles and bales.
Circle 67 on Reader Service Card

Reduces Bulk Handling Costs: Before you buy any tractor-shovel, The Frank G. Hough Company would like to show you the new Model HA in action. The company claims it will greatly reduce your bulk material handling costs.
Circle 125 on Reader Service Card

Prime Example: The Jervis B. Webb Co. "Power and Free" conveyor system in one of the large automotive plants is a prime example of accomplishment in efficiency, reduction of production costs and elimination of manual material handling, says this manufacturer.
Circle 112 on Reader Service Card

Special Talent: Smoothing and synchronizing the flow of materials and parts in manufacturing operations is the special talent of their conveyors, claims Alvey Conveyor Mfg. Co.
Circle 98 on Reader Service Card

Up, Down, Sideways: Short-radius "roller-coaster" dips and turns of its conveyors solves dip-tank operations, points out The Landahl Conveyor Co.
Circle 43 on Reader Service Card

Fast and Safe: How to bring ground level to truck level for fast and safe loading and unloading is described by Globe Hoist Company. Featured is Globe's hydraulic platform lift.
Circle 92 on Reader Service Card

Move or Store: The new fiberglass tote box is the unit for you if you move or store small parts, according to Molded Fiberglass Tray Company. The boxes are available in color for easy identification.
Circle 122 on Reader Service Card

Fast Installation: The newest and best in shelving, says The Frick-Gallagher Mfg. Co., is its Klip-Bilt steel shelving which it claims can be installed fast without tools, combining high strength with low installation cost.
Circle 119 on Reader Service Card

Mechanical Hands: Whatever you're handling, whether boxes, bags, bales or bulky shapes, Hyster Company offers to provide a lift truck equipped right for the job. They feature more than 100 job-handling mechanical hands as attachments for the truck.
Circle 111 on Reader Service Card

Built to Combat: Globe Neoprene rubber belting is built to combat everything from acids and alkalis to dust and dirt, according to Globe Woven Belting Co., Inc.
Circle 104 on Reader Service Card

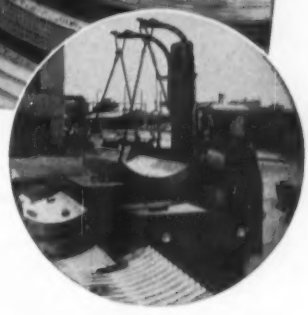
Just Right: Whether the application is routine or highly specialized, The Hamilton Caster and Mfg. Co. says you're sure to find a Hamilton truck that's exactly right for the job.
Circle 110 on Reader Service Card

Play Safe: It's best to play safe and use Inland round steel strapping, according to Inland Wire Products Company, which invites you to put the strapping to a test now.
Circle 73 on Reader Service Card

Get The Facts: The Youngstown Steel Door Company points out facts about its two basic types of bulkmaterials containers. The flexible design of the containers makes it easy to engineer them to your specification and size.
Circle 52 on Reader Service Card

Hundreds in Use: The new B-Line portable paper cutter brings the paper to the job. The S. J. Bina Company says there are hundreds of the units in use in factories and warehouses throughout the country, and they'd like you to try one too.
Circle 35 on Reader Service Card

Long Lasting: Many high quality features are incorporated into the cranes of Industrial Crane and Hoist Corp., says this manufacturer. Featured as a better value are the long-lasting forged steel wheels.
Circle 28 on Reader Service Card



SIDE-LOADING *Traveloader* DOES A JOB HERE NO OTHER HANDLING MACHINE CAN DO

Traveloader easily picks up long, awkward loads from the side and carries them securely and speedily to near or distant points—without changing travel direction. This unusual feature enabled a large mid-western steel company to set up a highly efficient system for handling and yard-storing heavy curved corrugated steel plate sections.

Unit loads weighing up to 9,000 pounds are placed on the Traveloader by overhead crane at the fabricating department, transported to storage area and tiered along 12-foot aisles. As needed, sections are picked up by the Traveloader and delivered to the shipping platform. A special attachment permits handling of single sections or "split lifts."

As a direct result of this method the company uses yard space to much better advantage, fills orders faster and substantially reduces handling manpower.

The Traveloader also handles pipe, lumber, loads weighing over 4,000 pounds and any awkward loads. It does yard maintenance work, positions machinery and performs many other handling jobs not practical or possible with any other equipment.

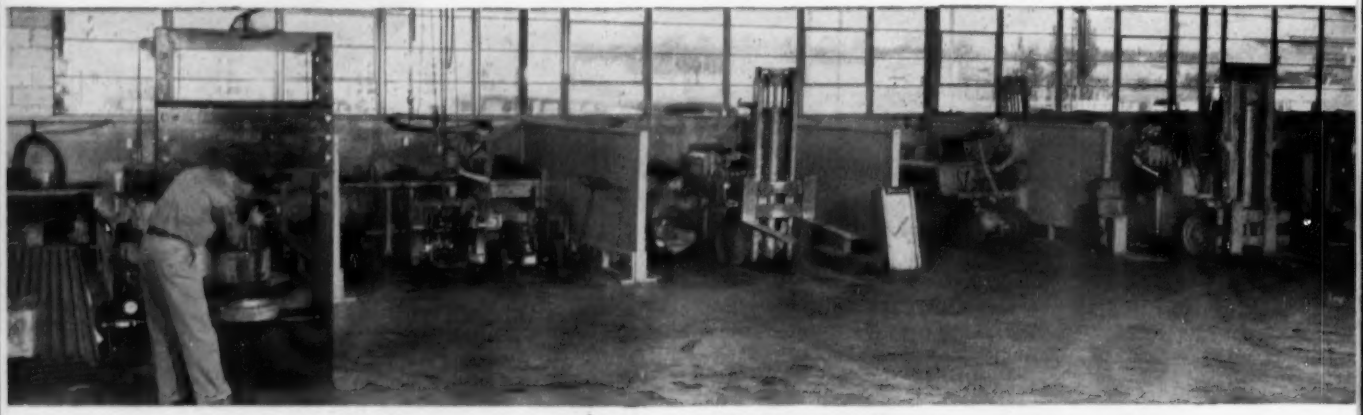
Write for Bulletin 1360. It completely describes the remarkable TRAVELOADER that carries like a straddle truck, delivers like a road truck, and stacks like a fork truck. The Baker-Raulang Company, 1219 West 80th Street, Cleveland 2, Ohio.

Baker.
industrial trucks

Circle No. 181 on Reader Service Card for more information

A Better Buy With

FAST PARTS SERVICE. Here's a sample of the largest parts inventory in the industry. It's a good thing to remember: you can depend on your local Clark dealer for a **complete** stock of Genuine Clark parts.



FACTORY TRAINED MECHANICS know your equipment best. Use specially designed tools and test equipment to meet Clark's rigid service standards.

MOBILE SERVICE for emergencies . . . for preventative maintenance on the job. Prompt service for tune-ups, minor repairs, lubrication, Genuine Clark parts.

Local Supply— Genuine CLARK Parts

Your local Clark dealer provides service facilities that have been developed for your needs. You expect the best from your Clark trucks and your Clark dealer is there to see that you get it. Here are 3 good reasons why it pays to put your service in the hands of your local Clark dealer.

1. Largest local supply in the industry. Your local Clark dealer's stock of parts is based specifically on the machine population in his territory. It's your best assurance of enough vital replacement parts to keep your equipment on the job.

2. Quality parts are guaranteed. Your local Clark dealer provides Genuine Clark parts—accept no substitutes. Get the parts that were engineered for your equipment . . . top quality parts that will give longer life, better service.

3. One source for complete service. Your local Clark dealer offers parts, maintenance, factory trained mechanics, a mobile unit for emergency service and preventative maintenance. It's your complete service package on a local level.

CLARK EQUIPMENT

Industrial Truck Division
CLARK EQUIPMENT COMPANY
BATTLE CREEK 13, MICHIGAN

A BETTER BUY WITH LOCAL SUPPLY . . . GENUINE CLARK PARTS

Circle No. 95 on Reader Service Card for more information

One truck does the work of many!

THE BROOKS **LOAD LUGGER**

picks up hauls dumps puts down

WHAT IT IS

The BROOKS LOAD LUGGER is a flat-bed truck body with a pair of hydraulic-powered hoisting arms, which is mounted on any truck chassis of suitable capacity. Standard models lift pay loads of up to 18,000 pounds at a time. Some special-purpose models lift much heavier pay loads.

LOAD LUGGER CONTAINERS are patented, tilt-dumping containers with deep, leak-proof bottoms. Capacities range from 1½ to 14 cubic yards for standard models. Some special-purpose models are much larger. A variety of open and closed containers handle solid materials, powders, sludge, liquids, and gases. Special pallets handle free-standing and unit-packaged materials.

Controlled by the driver from his cab, the truck-mounted Brooks Load Lugger lifts a Load Lugger Container onto its steel deck, carries it well forward for correct load distribution, cradles it between steel sidewalls for travel safety, hauls it away, dumps or spreads its contents, then returns the container and puts it down.

HOW IT IS USED

The LOAD LUGGER SYSTEM of materials handling calls for a number of Load Lugger Containers to be placed at points of need. These containers collect material as it accumulates, which reduces handling and eliminates loading crews. Then, loaded containers are picked up, hauled away, dumped, and returned on a regular schedule by a truck-mounted Brooks Load Lugger, which replaces many conventional trucks and eliminates loading time formerly required.

WHO USES IT

Industrial operations all over the country (quarries, foundries, steel mills, paper mills, refineries, chemical plants, brick plants, metal fabricators, etc.) use this versatile equipment to handle raw materials, finished products, and waste materials. Contract haulers of wet and dry refuse prefer Load Lugger equipment, as do scrap metal dealers, construction contractors, cemetery operators, and sugar cane growers. Government approval is evidenced by the many municipal, state, and federal installations. New uses and new users, such as cable reel handling by power and telephone companies, are constantly coming into the picture.

WHY THEY LIKE IT

The Brooks Load Lugger has no cumbersome superstructure or extra operating gadgets because of its patented simplicity, clean design, and sturdy construction. This results in a lower first cost, lower maintenance costs, the ability to carry more pay load on a given truck chassis, and a clear deck for multipurpose use. Its double-acting hydraulic cylinders, four-point container suspension, secure container cradling, and fully controlled tilt dumping are important contributions toward greater operational safety.

Load Lugger Containers are job-designed and job-proved. They are low and easy to load to full rated capacity. They dump clean because they are tilt-dumping, and they have no bottom openings to allow messy or insanitary leakage. Appropriate models are dust-proof, rat-proof, fly-proof, and almost odor-proof.

BROOKS EQUIPMENT & MFG. CO. 2031 DAVENPORT ROAD KNOXVILLE, TENNESSEE

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AD LITERATURE

Continued

Let Them Show You: Coles Cranes, Inc. asks that you let them show you how to save $10,000 plus. 'Nuff said?
Circle 31 on Reader Service Card

Continuous Flow: Mathews Conveyor Company tells how they've worked toward automation for 50 years . . . and they called it continuous flow.
Circle 46 on Reader Service Card

See How Simple: The P&H Magnetorque unit is so simple it never requires maintenance, according to Harnischfeger Corporation, which shows a cutaway of the modern crane control.
Circle 84 on Reader Service Card

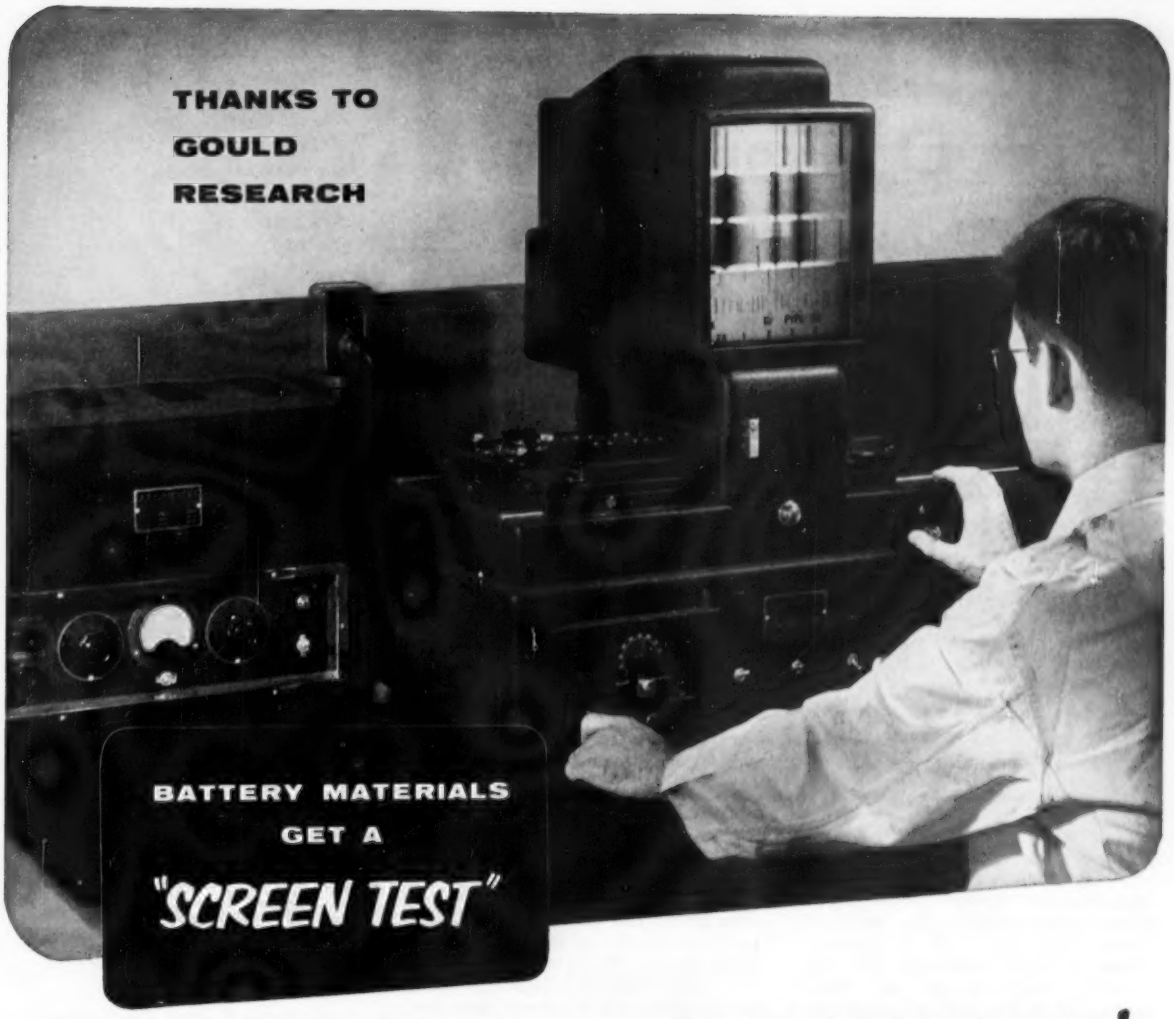
Roll Your Own: The American Pulley Company suggests you come to them for Steelite wheels that will really roll. The wheels are interchangeable and can be fitted to any axle size or hub length.
Circle 34 on Reader Service Card

Underhung and Top Running: That's what Chicago Tramrail Corporation has to say about its overhead cranes, designed to solve your material handling needs.
Circle 64 on Reader Service Card

An Easy Way: The Rapids-Standard Co., Inc. pictures an easy way for you to raise profits. Why not take a peek?
Circle 80 on Reader Service Card

Price of a Postage Stamp: Thilmany Pulp and Paper Company points out that it costs less than the price of a postage stamp to identify your product on its protective wrapping.
Circle 55 on Reader Service Card

First Choice: American Metal Products Co. says the simplicity of its storage racks is the feature that's made American storage racks first choice with many companies.
Circle 91 on Reader Service Card

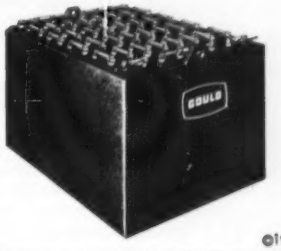


TO GIVE YOU BETTER BATTERY PERFORMANCE!

By projecting spectrographic film records on the screen of the Densitometer shown above, Gould research engineers can determine almost instantly the composition of battery metal samples and predict their performance under actual service.

Such "screen tests" together with other test procedures make sure that you get batteries with predictable performance and longer service life.

Gould research has taken the guesswork out of battery-making. Take the guesswork out of battery-buying by choosing GOULD!



America's Finest!
GOULD
Industrial Truck Batteries

©1955 Gould-National Batteries, Inc.

GOULD
Batteries

GOULD-NATIONAL BATTERIES, INC.
TRENTON 7, N. J.

"BETTER BATTERIES THROUGH RESEARCH"

Always Use Gould-National Automobile and Truck Batteries

Circle No. 39 on Reader Service Card for more information

Radio Dispatching Saves Trucks at Socony-Vacuum

RCA 2-Way Radio Makes Efficient "Automotive Pool" a Reality

(Above) Hydraulic lift raising pan to deck of loadlugger at Paulsboro, N.J. refinery of Socony-Vacuum Oil Company. *(Left)* Henry Cannavo, Assistant Foreman, Automotive, giving order via 2-way radio.

Pickup trucks, stake trucks, a fork lift, a jeep, a towmotor, winch truck and station wagon are radio-equipped for *instant control* by a dispatcher over a 33-mile radius at Socony-Vacuum Oil Company. These trucks are used for materials handling, maintenance, and labor transportation, one even going outside the plant to pick up materials. This has replaced the former method of assigning trucks to individual shops, causing idleness of some, at times, while others were overloaded. All are dispatched by RCA 2-Way Radio from a central control point.

"Two-way communication saves trucks," says Henry Cannavo, Assistant Automotive Foreman. "Take the case of our loadluggers, used to clear away pans of scrap filled by crews of laborers at strategic points throughout the yard. It used to be necessary to tie up dump trucks at these points. By substituting movable pans toted by radio-dispatched loadluggers, we estimate that five such vehicles are equal to 20 trucks."

In hundreds of installations, RCA 2-Way Radio is saving trucks—and money, by adding to the productivity of materials handling and maintenance vehicles, and reducing needless paper work and manhours. Are you making use of this profitable tool in your operation?

GET THE BEST—GET RCA 2-WAY RADIO . . . The high quality offered by the leader in radio and electronics gives assurance of top performance—under the most gruelling conditions. Simplest maintenance and operating requirements. The RCA Service Company makes available installation and service to keep your equipment operating at its peak.

MAIL COUPON FOR MORE INFORMATION

Radio Corporation of America, Communications Equipment, Dept. O-131, Building 15-1, Camden, N.J.

☐ Please send new booklet, "How RCA Radio Control Cuts Cost of Materials Handling."
☐ Please have representative call on me.

NAME _____ TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

RCA ® **RADIO CORPORATION of AMERICA**
COMMUNICATIONS EQUIPMENT CAMDEN, N. J.

Circle No. 47 on Reader Service Card for more information

AD LITERATURE

Continued

Screen Test: One of the procedures of Gould-National Batteries to make sure you get batteries with predictable performance and longer service life is a screen test by research engineers. Complete details are offered.
Circle 39 on Reader Service Card

No Overloading: You can't exceed the load limit if you've installed a Dyna-Switch on your equipment, says W. C. Dillon and Co., Inc. The switch may be connected to the motor or to a micro-switch for warning.
Circle 72 on Reader Service Card

Wide and Narrow: One lifter will handle both wide and narrow coils with the same speed and economy, if its a coil lifter made by Cullen-Friestedt Company, claims the manufacturer.
Circle 37 on Reader Service Card

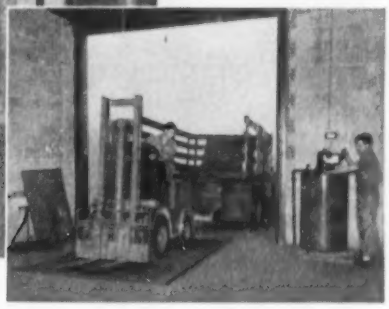
Want More Than You Have? Then Louden Machinery Company invites you to let them show you how to save space, reduce handling and increase production.
Circle 30 on Reader Service Card

Why It's Best: Nine points of superiority are listed by Lewis-Shepard Products, Inc. as to why the company's electric Model E fork truck is the best truck you can buy.
Circle 44 on Reader Service Card

You Can Forget: There's no need to worry about surface variations with Industrial Marking Equipment Company's Autoprinter, because the marker does a good job regardless of the surface condition, says this manufacturer.
Circle 68 on Reader Service Card

For Extra Work: C & D Batteries, Inc. tells why RCA uses its industrial batteries. The answer lies in extra work, but they'd like you to read the complete story.
Circle 69 on Reader Service Card

A Globe Platform Lift in this one-story building provides easy handling of heavy fork lift trucks.



BRING GROUND LEVEL TO TRUCK LEVEL FOR

FAST AND SAFE

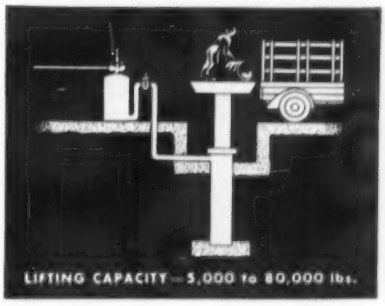
LOADING AND UNLOADING

Operated by positioning a valve, platform rests flush with floor in down position permitting cross traffic and storage when not in use.

Hydraulic power smoothly, quickly raises a steel platform from flush-ground level to truck-bed height. The need for ramps, gangplanks, manual lifting is eliminated. Work is speeded . . . and safe.

Loads move *on the level* . . . from one level to another. Thus breakage and accidents due to the unsteadiness of moving loads up and down inclines is eliminated.

Globe Platform Lifts quickly pay for themselves. Standard, low-cost designs meet most needs and are available for quick delivery. Variations to meet unusual handling requirements are readily supplied.



GLOBE

PLATFORM LIFTS

PLANTS: DES MOINES—PHILADELPHIA

Globe Hoist Company F-703-PL
East Mermaid Lane at Queen Street
Philadelphia 18, Pa.

Please send me a copy of "MODERN LIFTING" (Form 663).

Name.....

Company.....

Address.....

City and Zone..... State.....

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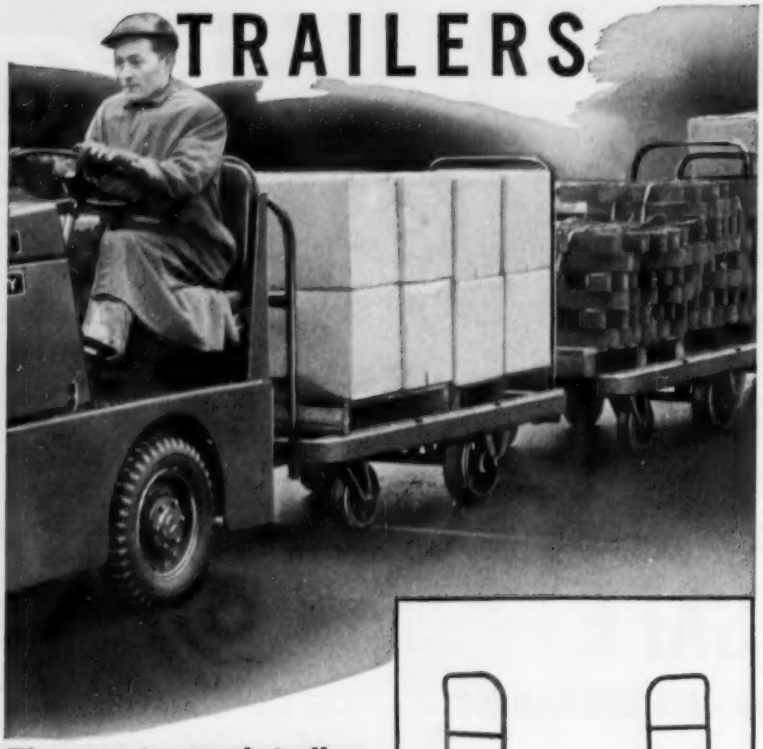
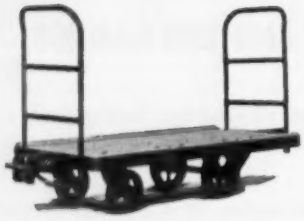
TONNAGE TRAVELS FOR LESS ON THE MERCURY "TRACKLESS TRAIN"

MERCURY TRAILERS



The most complete line of industrial trailers

Save valuable man-hours with the *low cost* tractor-trailer method. Free of any fixed path — the versatile Mercury "TRACKLESS TRAIN" travels wherever material movement dictates... long hauls, short hauls or snaking through congested areas. Delivers *more* tonnage at *lower cost* because the "Trackless Train" keeps loads on wheels and readily movable by hand for short distances. Moves more tonnage by merely adding more trailers . . . no increase in power units.



Mercury A-310 Castor Steer Trailer—For nearly a half century industry has accepted the A-310 Trailer as its standard because of its suitability for general all-purpose work and its ability to provide the lowest cost transportation per ton mile.

Mercury trailers are designed to meet the flexible requirements of the user. Models include castor steer, fifth-wheel steer and four-wheel steer trailers in capacities ranging from 2000 to 60,000 lbs. . . . decks and bodies can be built to suit the commodity handled. Find out how Mercury trailers will save you money and solve the problem of horizontal movement of materials.

Write for free bulletins describing Mercury trailers today.

MERCURY
FORK TRUCKS · TRACTORS · TRAILERS

MERCURY MANUFACTURING COMPANY
4154 South Halsted Street • Chicago 9, Illinois
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AD LITERATURE

Continued

Surest Solution: Goodyear's Industrial Tire Division tells why its job-fitted industrial tires are your surest solution to down-time problems.
Circle 127 on Reader Service Card

Built Up: Whatever your requirements, Colson Corporation suggests you consult them for material handling equipment, as their products are built up to a standard, not down to a price.
Circle 116 on Reader Service Card

Costs You Nothing: You can find out for free how you can own a Market Forge Company Loadmobile fork truck for $2.89 per day, and the company invites your inquiry.
Circle 89 on Reader Service Card

Best Tip: If you're looking for a good tip for wheeling coal, scrap, chips, turnings or similar heavy materials, Sterling Wheelbarrow Company suggests you see its heavy duty carts.
Circle 70 on Reader Service Card

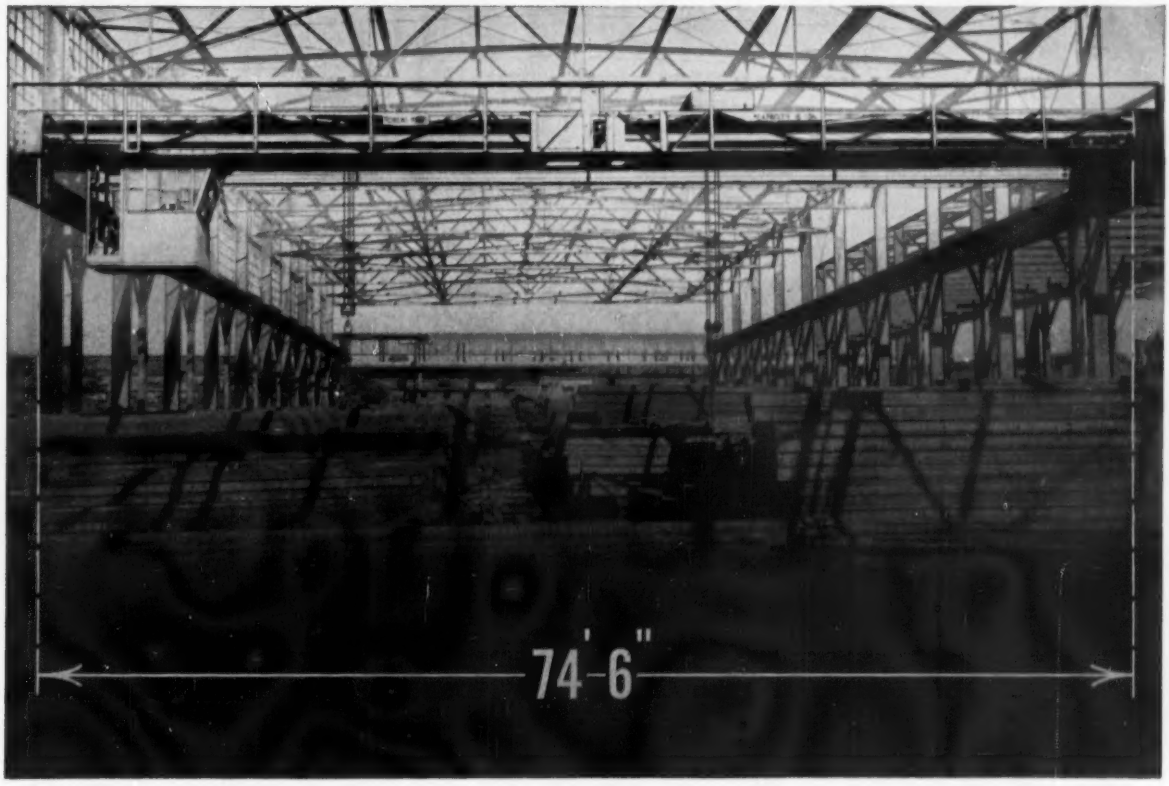
A Natural: Lifting with the Keller 86A-1 air hoist is as natural as lifting by hand, but it's effortless, according to Keller Tool Company.
Circle 40 on Reader Service Card

Makes His Point: When "George" the tote box truck rolls them, he makes his point. Find out from Rolock Inc. how it's done.
Circle 3 on Reader Service Card

Working Both Ends: There's no trick to working both ends from the middle with Speedlift's portable power belt conveyor, according to Speedways Conveyors, Inc. The units are said to be lightweight, adaptable and versatile.
Circle 54 on Reader Service Card

How to Profit: Conveyorize to profitize says Metzgar Conveyor Company, who'd like you to see them before you buy.
Circle 8 on Reader Service Card

TAKE IT UP WITH R&M HOISTS-CRANES-WINCHES



BIG R&M CRANE MOVES STEEL FOR KILROY

R & M built this big 15-ton crane to lift and move structural steel—never a dainty, packaged commodity—with two-handed flexibility. Two 7½-ton R & M Type "F" Hoists, independently controlled from the cab of this double-girder, five-motor crane, eliminate dangerous load-balancing.

Maximum bridge deflection (loaded), ½". End truck length, 15' 2", wheelbase, 11'. Bridge speed, 250 fpm maximum. Bridge control, six-step variable speed. Bridge brake, foot-controlled hydraulic. Hoist lift, 20'. Lift speed, 20 fpm. Trolley control, four-step variable speed to 125 fpm. Total crane weight, 60,000 pounds. User, Kilroy Structural Steel Company, Cleveland, Ohio.

Pictured at right—45-foot span, 20-ton capacity R & M crane with 5-ton auxiliary hoist. Standardized cranes in single or double I-beam types available quickly in 20 to 65-foot spans; capacities to 10 tons.

BRING YOUR R&M HOIST DATA FILES UP TO DATE. SEND FOR FREE BULLETIN.

☐ Have representative call ☐ Send Bulletin No. 825-B

VENTILATORS MOYNO PUMPS HOISTS CRANES MOTORS FANS

ROBBINS & MYERS INC.

SPRINGFIELD, OHIO BRANTFORD, ONTARIO

Circle No. 22 on Reader Service Card for more information

AD LITERATURE

Continued

Unusually Versatile: Let Gifford-Wood Company tell you about the versatility of its G-W Flowmaster bulk conveyor.
Circle 11 on Reader Service Card

Cradle System: How Sears solved carpet storage and handling problems in their Los Angeles warehouse to pass big savings on to their customers is told by The Easiquip Company who installed the cradle system.
Circle 53 on Reader Service Card

Where It Belongs: Shepard Niles Crane and Hoist Corporation suggests you put your handling where it belongs—overhead.
Circle 1 on Reader Service Card

Fast Service: Baldwin-Lima-Hamilton's extra-fast service from coast-to-coast is said to make the difference between continuous, profitable production and high-cost idleness of equipment.
Circle 109 on Reader Service Card

Thousands Saved: In just one year a Trackmobile user saved $11,530 in railway car switching and spotting costs. Read the complete story as told by Whiting Corporation.
Circle 29 on Reader Service Card

All-Purpose: There's no doubt about it, says John A. Roebling's Sons Corp., you'll cut handling costs with Roebling all-purpose slings.
Circle 5 on Reader Service Card

For Kilroy: Robbins and Myers Inc. 15-ton crane moves thousands of pounds of steel daily for Kilroy Structural Steel Company. They'd like to put the cranes to work for you, too.
Circle 22 on Reader Service Card

Take A Good Look: That's exactly what the "Tiger" of American Steel and Wire Division is asking you to do this month. The product is Tiger brand wire rope, and the ole boy's proud of his namesake.
Circle 14 on Reader Service Card

Two Strips: The successful, modern way to seal is with two strips instead of six, according to American Sisalkraft Corporation. Maybe you should investigate.
Circle 24 on Reader Service Card

Demonstration? If you'd like a demonstration of a Walkie-Worklifter in your plant, Economy Engineering Company will be glad to oblige you!
Circle 16 on Reader Service Card

Streamlined: There's no reason why you can't have a streamlined small parts handling system in your plant, according to The Chas. Wm. Doepke Mfg. Co., Inc. They'll gladly furnish facts and figures.
Circle 23 on Reader Service Card

"Roll your own"—faster, easier with AMERICAN Steelite® Wheels

Steelite Wheels are but one of the many specialties made by American. A full line of hand trucks—over 50 different models for every moving job—is also available.

American Steelite Industrial Wheels are *interchangeable* right in the plant, can be fitted to *any* axle size or hub length. Steelite Wheels are light weight pressed-steel, weigh 3 to 18 lbs. less than comparable size cast-center types yet are equally strong. Specially designed ball bearings have hardened-through races instead of mere case-hardening. Inner races are extra wide to end axle wear. Built-in seals keep grease in, dirt out. Rubber treads are "rolled on so they can't roll off" in service.

The full line of American Trucks—50 models and sizes for every use—features Steelite Wheels as standard equipment.

See your distributor or write for a free catalog on the American Hand Truck Line. The American Pulley Company, 4290 Wissahickon Avenue, Philadelphia 29, Pa.

American Hand Trucks

Light weight all-steel. Smooth joints and surfaces protect loads. Finger-tip balance moves more with less effort. Steelite wheels give years of extra wear. Sold with a 5-year guarantee.

American Barrel Cradles

All-steel construction. Patented, disappearing loading bar. Shipped semi-knocked-down in cartons to save warehouse space, keep cradles in top condition.

American Appliance Trucks

Strong light weight magnesium construction. Adjustable side rails. Heavy web straps with self-locking buckles. Rubber-padded contact surfaces. Endless-belt stair climber. Special types for all appliances.

AMERICAN HAND TRUCK HEADQUARTERS

Stocked and sold nationally by over 350 distributors

Materials Handling by AMERICAN

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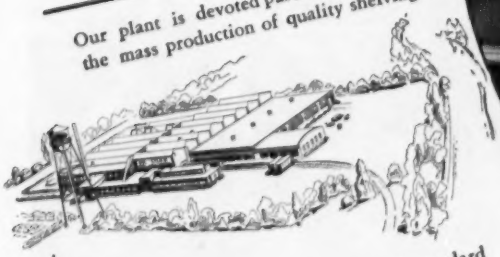
DeLuxe CUTS INSTALLATION EXPENSE

50% OVER ORDINARY SHELVING

TIME CONSUMING INSTALLATION DETAILS ELIMINATED

Our plant is devoted particularly to the mass production of quality shelving.



DeLuxe . . . the acknowledged standard of comparison . . . for over 25 years.

DeLuxe

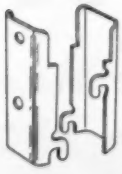
DE LUXE METAL FURNITURE COMPANY
317 STRUTHERS STREET
WARREN, PENNSYLVANIA
Division of
Royal Metal Manufacturing Company

FREE . . . Write for complete 48 page fully-illustrated catalog of DeLuxe Steel Shelving.

HERE ARE GOOD REASONS WHY DELUXE BUILT-IN FEATURES MEAN LOWER SHELVING COSTS TO YOU:

SPEEDS ASSEMBLY

- One piece bin type upright—offers I beam strength. Speeds assembly.



SHELF BRACKETS

- Especially designed shelf-brackets make *each* shelf *independently* adjustable.

FLOOR ANGLE

- Bottom shelf support and floor angle permits assembly in vertical position; evenly distributes floor surface load.

HEAVY DUTY SHELVES

- Shelves have reinforcing bar imbedded into front and rear flanges and returned into the end flanges where they engage the uprights.

PLUS . . . these components which give added strength and quality:

- One piece back
- Patented snap-on dividers
- Patented snap-on bin fronts
- Shelves coped to fit uprights—permits full use of shelves and flush appearance

Circle No. 166 on Reader Service Card for more information

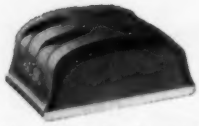
From Timken-Detroit Axle Division, Rockwell Spring and Axle Company comes this statement:
"In our Forge Shop—Plant No. 2, where the floor surface is extremely rough, we used to wear out a set of industrial truck tires in only two months. Then we switched to the U. S. Royal Innacush. *These* tires haven't been changed in *six* months and still show very little wear..."
U.S. INNACUSH

Far Less Cost-Per-Hour

assured by this softer-riding tire!

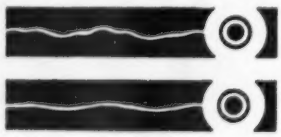
Leading industrial truck users have found that the exceptional performance of U. S. Royal Industrial Tires is saving them money.

For example, this U. S. Royal Innacush has a double-tread, an exclusive "U. S." construction feature. Outside—it's tough, for longer tread wear. Inside



-it's resilient, for exceptional shock absorption and softer riding.

With these advantages, the tires last far longer, and the equipment and load are less subject to destructive shocks and jolts. Compare these two illustrations. The jagged line on top—representing the motion of a truck's axle—shows how an ordinary tire conducts shocks. The bottom line shows the Innacush on the same route, sponging up floor irregularities.

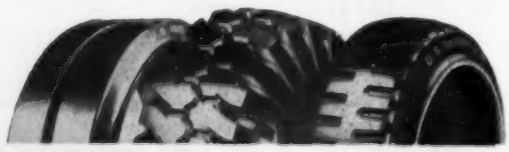


Why not let the Innacush lower *your* cost-per-hour? It comes in two types—the regular pressed-on version or the new *Demountable* Innacush you can change in 10 minutes *without* pressing charges and costly down-time!

U.S. ROYAL INNACUSH

the original cushion solid

U. S. Royal makes a complete line of industrial tires



For further information, write Industrial Tire Dept.,

UNITED STATES RUBBER COMPANY

1230 Ave. of the Americas, New York 20, N.Y. • In Canada: Dominion Rubber Company, Ltd.

Circle No. 190 on Reader Service Card for more information

An objective report on the leasing of industrial trucks. Since there are both advantages and disadvantages to such a program, it is vital that every prospective truck user know all the facts concerning leasing versus actual purchase, and be able to evaluate all information on the subject now being made available.

W. H. Campbell

PROS and CONS of Equipment Leasing

By William H. Campbell, Treasurer
The Elwell-Parker Electric Co.

MOST industrial truck manufacturers are in a neutral position on the subject of leasing. They are in the business to sell trucks, and the manner in which they are financed is secondary.

There is to the user, however, an important aspect on taxes. It is our opinion that rental payments on a straight lease, with an option to renew at a reasonable rate but without an option to purchase, can probably be treated as expense deductions for income tax purposes.

If the option to purchase at fair market value clause is added, rental payments can probably still be deducted as an expense, but this is less certain. With the option to purchase for one dollar, we feel that the transaction will be considered a conditional sale that should be so treated for income tax purposes.

In any event, there have been, so far as we are able to ascertain, no specific rulings by the Federal Internal Revenue Bureau on these points for this type of equipment. We are not tax advisors and, therefore, recommend that each company obtain legal counsel as to the method of handling rental payments on leased equipment for tax purposes.

There is no rule of thumb on which to base a decision for leasing. So many factors must be considered that the merits of the plan for a given firm must depend entirely on its circumstances and requirements.

There are many clear-cut cases where leasing provides the best, and perhaps the only, means of obtaining a much needed piece of equipment. But there are just as many cases where the decision must be based mainly on forecast and opinion.

• *Effects On Working Capital*

Certainly, if a shortage of capital exists, leasing may offer the only means of obtaining an industrial truck. However, even where capital may be plentiful, it is possible that it could be invested elsewhere to better advantage. It is thus actually possible for a lease to permit double profit.

Let's examine this double profit idea more closely. First, the new truck will be part of a profitable venture; otherwise it would not be bought. Second, the capital kept available through leasing the equipment may be invested elsewhere in a business, thus also returning more profit.

As an example, the term "turnover" is often used in merchandising. A fast selling item may turn over six times per year, returning a profit on the money invested six times. A slow moving item may turn over only two times a year, returning a profit only twice.

The same principle applies to capital invested in a manufacturing plant. The capital may be invested in raw materials from which will be made a finished product. Or it may be invested in machinery to improve those products. The more raw material bought and the faster the finished product is sold, the more profit is realized. Capital applied to these productive assets may turn over several times a year, generating profit with each cycle. Restating this theory, then, the lease frees working capital which, if invested in a company's operations, creates profit. This return-on-capital theory is perhaps the one indisputable advan-

(More on next page)

Continued

tage of leasing. Care must be taken, however, to make certain that the profit derived from the reinvestment of capital saved through leasing will result in substantially greater profit than the leasing cost.

The rate at which capital earns profit for a company can be determined by dividing the total assets of the company at the beginning of the year into the year-end profit before taxes. This ratio might be 21.9 percent.* But, in making this calculation, the fact not considered is that such assets as machinery and equipment have been paid for in advance. Thus, to get a more realistic evaluation of how much profit working assets create, so that a fair comparison with the cost of leasing can be made, consider only the assets paid for during the year. Take from the financial statement the cash, receivables and inventory—that is, current assets *and the yearly depreciation allowed for machinery and equipment*—leaving the total working assets. Dividing this figure into the operating profit before taxes gives a better picture of how working capital invested in working assets can result in profit. Where the ratio was 21.9 percent* before, it now may be 42.4 percent.* Comparing this figure with the interest rate charged for leasing presents a clearer, fairer picture of the two alternatives.

• *Some Tax Considerations*

Leasing is *not* a means of avoiding taxes. Leasing is attractive, though, from the standpoint of tax deduction timing.

The useful life of an electric truck for tax purposes is ten years. Under the straight line method of depreciation, a truck purchased for $5,000 could be depreciated at the rate of $500 per year. With a three year lease, however, a company would be permitted to write off the cost of the truck plus the service charge in three years. Since the lease permits the concentrating of the deductions from taxable earnings in the early years of the equipment's life, cash flow from the business can be reduced and used to better advantage.

Keep in mind that the sum total of taxes paid is practically the same whether a company buys or leases. There may be a slightly higher tax due to increased profits from investment of money freed through leasing. Since most lease plans provide for a low rental fee after expiration of the lease, tax deductions will be correspondingly lower during the later years of the equipment life.

In the above comments, it is assumed that the tax rate will remain constant. If taxes go down, the lease will give even greater advantage because a company will have used the greater share of its deduction during the period of highest taxes. If taxes go up, of course there will be a corresponding disadvantage.

Recent changes in the federal tax structure in relation to depreciation have a bearing on the matter of leasing. They have made it possible to accelerate tax write-offs during the early years of the life of purchased equipment, thus taking away some of the tax benefits from leasing.

Leasing, too, can be arranged for accelerated payments in the early stages, with correspondingly lower payments as the term of the lease continues.

Still another point affecting write-off of equipment is the fact that the term of the lease is often far shorter than the expected life of the equipment used for depreciation purposes, thus permitting faster write-offs than even the accelerated depreciation schedules.

It is necessary for each individual company considering leasing to weigh the advantages of the various possibilities.

With this strong point of fast write-off, what is the basic advantage of postponing taxes and taking deductions as quickly as possible? The answer is simply that money is thus made available earlier and can be put to work in a business sooner, thus letting it work longer to make the profit return greater.

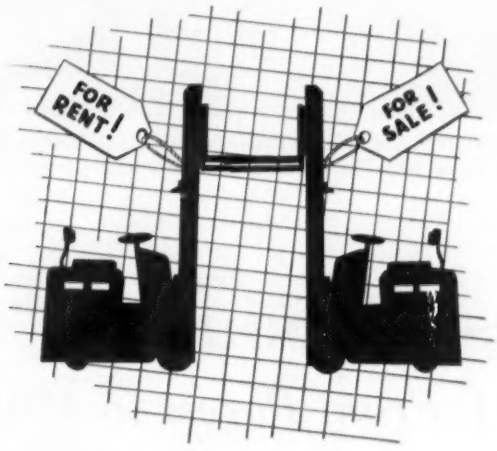
Looking at it from still another point of view, a dollar invested at 4 percent compound interest for ten years will yield $1.49. That dollar invested in working assets in a business at a return of, perhaps, 42.4 percent would be worth $63.50 in ten years. Constant turnover of the money saved from taxes generates profit, and the sooner it can be put to work, the larger will be the return. It must still be decided whether the new write-off programs allowed by the Federal Government or the deductions offered by leasing will provide more revenue.

**The percentage figures quoted are based on average figures taken from the 1952 financial statements of the nation's five largest manufacturing firms.*

• *The Lease as a Hedge Against Inflation*

The age-old problem of depreciating equipment at a rate too low to permit replacement at the end of the equipment's life may be partly solved because, as has already been discussed, leasing permits faster tax write-off than outright purchase. Thus the lease acts as a hedge against inflation. This results from the fact that money is available sooner under leasing—for investing in new equipment with cost lower now than it might be in the future if inflation increases equipment cost or devaluates the dollar.

As an example, let us assume that an industrial truck is purchased and written off over a ten year period.



All the money recovered from taxes is thus not available for ten years. When leasing, the cost of the truck is written off in, for example, three years, making the money available seven years sooner. In the former case, the replacement cost of the truck may have increased substantially during the ten year period. In the latter case, the period of time is shorter and the likelihood of an increase in replacement cost substantially reduced. Thus by fast write-off, dollar investment in capital equipment is recovered more quickly and the likelihood of dollar devaluation during the period is reduced.

• *Write-offs in Big Profit Years*

Another advantage of the fast write-off possible through leasing is the fact that a heavy volume of business may be expected within the next few years—in which case taxes will be higher and the desirability of tax write-offs greater. Later, it may be that business or profits will fall off so that it will be advantageous to take deductions on newly acquired equipment during the better years, when profits before taxes are highest.

• *The Lease as an Operating Budget Control*

Lease payments are rent. Rent is an expense item. Since operating personnel are responsible for factory expense they will use more care in determining the relative savings which a new industrial truck will produce. If new equipment is a capital expense, it then becomes management's responsibility to justify the expense, and the operating personnel do not feel the direct responsibility of making certain that the acquisition is a profitable one.

• *Leasing vs. Borrowing Capital*

In reality, there is no great difference between borrowing money at the bank to obtain an industrial truck and leasing the truck. In both cases, interest or service fees are charged. Likewise, the company requiring the truck must have approximately the same credit standing in order to negotiate either transaction. And through use of the options available, the lease can be arranged so that the truck will ultimately become the property of the leasee as would be the case if it were purchased with money borrowed from the bank.

In favor of leasing is the fact that no initial or down payment is required. The entire cost of the equipment can be financed at a very reasonable rate. Secondly, it is well to remember that debt financing appears as an item on the balance sheet, while lease financing appears only as a footnote.

Since some management people have a personal aversion to borrowing, the lease also offers the possibility of obtaining needed equipment without borrowing in the strict sense of the word.

• *Short Term Requirements*

If a truck is required for only a relatively short period—such as during a special government or other industrial contract, model change, introduction of new product, etc.—leasing may offer quick and inexpensive temporary possession. This is particularly true if the cost of equipment can be recovered in the price of the contract. The lease will permit write-off of the cost over the period of use and eliminate complications created by capitalization at unrealistic depreciation rates during periods when the truck is no longer in use. In the case of government contracts, the lease eliminates problems and uncertainties involved in obtaining accelerated depreciation write-offs or in determining the residual value of equipment at the end of the contract.

Saving The Cost Of Leasing

The decision to buy an industrial truck is dictated by the fact that a company expects to save money by reducing material handling costs. If, for any reason, capital for the purchase is not readily available, leasing permits the truck to be put in operation at once on a "pay as you save" basis. The case is rare when a truck cannot save a great deal more than the cost of the lease. And even when the lease expires a company can still expect to benefit from the truck's savings although it may be paying rental on it. Again, the savings will unquestionably be greater than the rental fee.

In the case of replacing obsolete equipment, the same theory applies. The lease payments on a new

(Continued on page 126)

BY TRACTOR:

CRAWLER TRACTOR equipped with lift tongs loads out heavy redwood logs. The tongs hold log securely.

TRACTOR-SHOVEL has conventional scoop removed, replaced with fork lift attachment for piling logs.

Handling Forest Products

Part I: From Forest to Mill

THE movement of forest products has improved tremendously since the days when felled trees were dragged out of forests by horse or mule. The old-time river drive is almost unknown today. And, although sky lines, spar trees and logging engines are still used in certain types of terrain, their usage is becoming more and more infrequent.

Whether handling the huge monarchs of the forest, or smaller trees, material handling equipment has greatly simplified and speeded up their movement. Furthermore, whatever size or type of log or wood being harvested and routed through the forest products industry, topography, which at one time was extremely important, has become less significant as a determining factor in selecting the type of handling equipment best suited for each job.

> ***Part II: At the Mill***
>
> Next month, the handling of forest products will be discussed further. Included in the second half of this survey will be methods, systems and equipment used to handle forest products from the time they arrive at the mill as raw material until they emerge as the finished product.

Movement of logs, pulpwood and other forest products by rail is still practiced to whatever extent and under whatever conditions it is found more economical than other transportation. Actual logging railroads of the narrow-gauge type, however, have given way almost entirely to the combined efforts of tractors and trucks. Modern earth-moving equipment can build logging roads for highway trucks and trailers so economically that these vehicles, hauling loads from landing to mills, fill an increasingly large section of the log-handling picture.

Trackage Still Used

However, the use of trackage has not been abandoned by any means. In swampy areas, for example, laying tracks and utilizing rail cars and locomotive-mounted cranes and other equipment is the only sound solution to the transportation and handling problem.

In days when river drives were not uncommon, a popular means of transporting logs was with a large flume, or trough-type waterway, often fed at the top by a mountain stream. Logs deposited in this flume, with the stream directed into it, were swiftly carried considerable distances from higher to lower ground.

This method is still available where large quantities of logs are moved from high ground to low, but in-

FRONT-END LOADER with log forks easily picks up, transports, stacks logs. Note backrest for safety.

stallations of this type are becoming rare. Obviously, the cost of flume construction and maintenance, as compared with other means of bringing in logs, is the deciding factor against this method of transportation.

There is one type of water transport for logs which is still widely used, particularly in the Northwest and other areas where large waterways are available. It is the rafting of species of logs which float well, and towing these rafts by tugboat. Some concerns make such towing a regular and contract business.

A modern aspect of rafting logs is preliminarily strapping them into bundles, using the same general type of strapping employed for other purposes. However, strapping logs into bundles is not limited to raft construction for towing in large waterways. Logs stored in sawmill and veneer mill ponds often are strapped. This practice greatly increases the capacity of a mill pond, and also facilitates log handling.

From the time a tree is felled until it reaches the mill,

(More on next page)

SWIVEL CLAM GRAB on this loader can handle big loads of pulpwood, and rotates for accurate loading.

DOZER-EQUIPPED TRACTOR loads logs on skid, and later the same tractor hauls the skid to the sawmill.

LOGGING FORKS on front-end loader shown here is dumping logs into storage pond; also loads, stacks.

LOGGING ARCH keeps front ends of logs clear of ground as they are skidded, making movement easier.

BY POWER CRANE:

SINGLE GRAB on this crane lifts logs which have been skidded by tractor; they are loaded on trailer.

TWO-LEGGED SLING utilizes two grabs which pick up logs at both ends for stability during loading.

HANDLING FOREST PRODUCTS

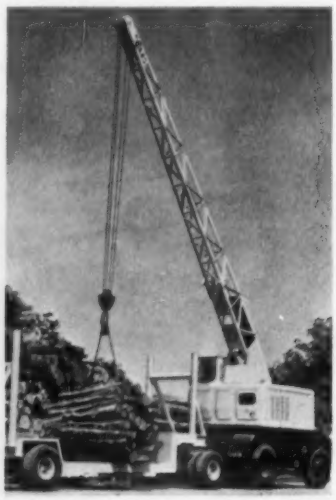
Continued

maximum log production at the lowest possible cost depends upon several factors, two of the most important being (1) using the right equipment and (2) following the right procedures. This is particularly true in the "stump to landing" and loading phases of any logging operation.

No two logging operations are exactly alike, and many factors influence the selection of equipment and procedures to be followed. Only a few conditions, however, influence any one specific operation. And, once these factors have been established, selecting the proper equipment to use and procedures to follow becomes relatively easy.

Crawler-mounted vehicles, for example, can penetrate into exceedingly rough terrain, into muddy locations and other hard-to-negotiate places. These vehicles, equipped with various log-handling devices, easily move logs over a wide range of topographical conditions. And, while highly efficient, many of these handling aids are comparatively simple.

TRUCK-MOUNTED CRANE equipped with pulpwood grapple is shown loading 4-foot pulp sticks into railroad cars from truck at rail terminal.



CHAIN SLING is used to unload and also stack bundled cedar logs.

STATIONARY MOUNT replaces undercarriage on this hoe which picks logs from pond, loads railroad cars.

MOBILE CRANE works deep in wooded area and loads logs on motor truck for transportation to the mill.

For instance, tractors provided with choker lines can simply skid logs over the ground. To a degree, this ground skidding technique is present in some form in most log transporting methods used in the woods. Advantages of ground skidding are most evident in rough terrain, where footing conditions are poor, in scattered timber stands and where distance to the landing is relatively short—usually no more than 300 feet.

Whatever trouble may be encountered with leading ends of logs ploughing into the ground when skidding can be overcome with skid pans. With the forward ends of the logs lying in a skid pan, they can ride up over slight ground elevations without danger of ends digging in. While the skid pan method is recommended for tractors skidding moderate amounts of logs, tractor-skidding of logs in large numbers, and especially in larger diameters, is far more efficient where suitable logging arches are employed.

A logging arch lifts the forward end of a group of choked logs completely clear of the ground while they are being hauled in. Since only rear ends of the logs slide along the ground, friction and ploughing effect is reduced considerably, resulting in increased pulling effectiveness of the tractor, cleaner logs delivered to the mill, lower maintenance costs and less damage to standing timber. With this method, distances up to two miles can be logged economically.

Although the logging arch is an important tool for log handling with a tractor, it is but one of many attachments which add to a tractor's versatility. An ordinary bulldozer is frequently employed to push logs.

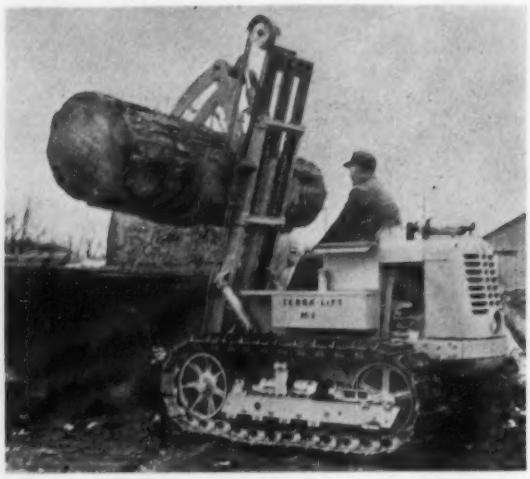
(More on next page)

LOG BOOM is used because of chafing during loading operation.

CRAWLER-MOUNTED CRANE handles a variety of jobs, including loading, unloading and decking. Here, logs are unloaded from cars into pond.

BY INDUSTRIAL TRUCK:

STRADDLE CARRIER, commonly used to handle unit loads of lumber, also picks up and carries heavy logs.



FORK TRUCK shown here handles logs which average nearly 10 tons in weight, often stacks them 15 feet.

HANDLING FOREST PRODUCTS

Continued

Often, logs pushed in this manner will roll as they travel, reducing ground friction and minimizing the effort required to move them.

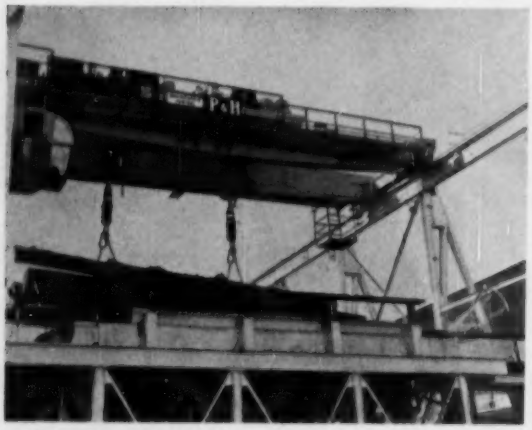
In some instances, a bulldozer is used to load logs onto low skids, and the same tractor then pulls the skid load of logs out of the woods. Again, a bulldozer mounted on the front end of a tractor is used to manipulate logs into piles, or into convenient position for further handling at a landing.

Frequently, dozer-equipped tractors are used to push logs into storage ponds. Tractors also are equipped with special lifting forks, when feasible, which may be used for loading logs on skids, trucks, or into and out of piles in dry storage, at landings and at mills.

Tractor-shovels, too, are often used to load, unload and transport logs. By removing the scoop which normally handles bulk material and replacing it with forks, logs are easily picked up and carried.

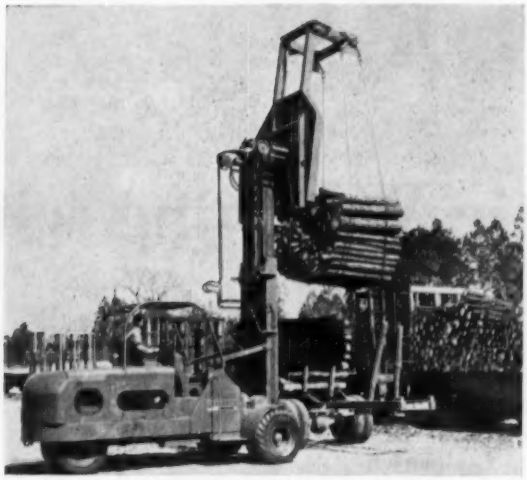
And, industrial trucks in increasing numbers are lending valuable aid in handling a variety of forest products. However, although they are employed to handle logs, fork trucks and straddle carriers are used to a much wider extent for handling lumber, particularly after it has been bundled or otherwise assembled into unit loads.

BY OVERHEAD CRANE:



TWIN-TROLLEY CRANE at wood products processing plant loads logs on conveyor leading to plant.

BRIDGE CRANE, which is Diesel-powered, deposits logs into pond after unloading them from log trailer.



PULPWOOD ATTACHMENT enables quick, safe loading where crane use is limited or impossible.

GRAB LIFT on crawler-mounted unit holds logs securely for lifting, carrying and loading operations.

Various types of power cranes have become invaluable in handling forest products. Because of the availability of a number of different attachments, they handle, with equal ease, logs, pulpwood, poles, railroad ties and many other products. In rough or soft terrain, crawler-mounted units provide the best traction; where footing is not an important factor, truck or wheel mounted cranes will do the job. Of course, where railroad trackage is available, locomotive cranes may be used.

Quickly-interchangeable slings, grabs, hooks and grapples used in conjunction with power cranes make them adaptable to almost any forest product handling work required, from loading and unloading trucks, trailers and rail cars to stockpiling and logging out.

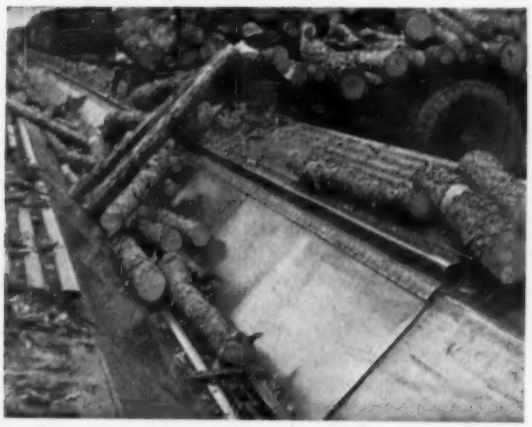
Bridge cranes also are used to handle forest products. These include lightweight monorail cranes, as well as the heavy models. Bridge cranes are often employed for such services as removing an entire load of logs from a truck at once, depositing it in a pond, or into dry storage, as the case may be. There are some instances, too, where cantilever cranes handle logs from trucks to pond, and perform other similar duties.

Incidentally, whenever it can be conveniently arranged, water storage is much better for logs at the mill than dry storage. It prevents them from drying out and cracking at the ends. Water storage also protects them from insect attack, which has been the cause of degrading many logs in dry storage.

Conveyors of different types play a large part in handling and transporting forest products. In some cases, special types of chain conveyors are particularly suited for given jobs. Overhead chain conveyors have

(Continued on page 127)

BY CONVEYOR:



LOG CONVEYOR in trough receives logs at truck and railroad siding dump and carries them to a paper mill.

FOUR-STRAND CHAIN conveyor with log pushers picks up logs from pond, transports them to barkers.

How To Maintain . . .

Accurate Automatic Weighing with

By John K. Rudd
Chief Research & Applications Engineer
Richardson Scale Company

QUALITY control charts for determining accuracy of automatic scales are being used by an increasing number of plants to keep a closer check of their processes. A suggested method for making up such charts is outlined here.

However, before any attempt is made to utilize these charts, three basic facts should be clearly understood: 1) What statistical quality control is; 2) Fundamentals of probability; 3) What standard deviation means.

1. *What Statistical Quality Control Is.* We can define with mathematical certainty the inherent variations in any process. We also can accurately define the precise limits of variation that can be tolerated without exceeding the specified process requirements.

When this has been done, we may set down and later maintain a standard of quality for the process. We can, for instance, signal an immediate warning whenever established limits are exceeded.

How do we get this control? We start by collecting quantitative data, and then analyzing it, applying sound, proved statistical techniques. This process of collection and statistical analysis of data to regulate quality is called statistical quality control.

Based on the laws of probability—perhaps familiar to those who have bought insurance, played poker or matched coins—statistical quality control's foundations date back many years. Only in recent years, however, has the science been developed and accepted as a reliable means of process control.

In dealing with automatic weighing, we are particularly interested in two phases of statistical quality control. The first is to find out how accurate a particular scale is. The second is to determine whether this accuracy is within the requirements of the process.

Naturally, we must know what accuracy a given scale can deliver before we can tell if the scale will meet specific requirements. This is not as simple as it sounds for the accuracy is influenced in large measure by the characteristics of the material being weighed and by the size and uniformity of the stream admitted to the weigh hopper.

2. *Fundamentals of Probability.* The laws of probability have an effect on any process or operation. If the process or operation is not being influenced by some outside source, the effect of probability can be seen readily. For example, in tossing a coin one-hundred times, anyone would expect the number of heads and the number of tails to be about the same, if the coin is normal and is tossed in the same way each time.

Similarly, in one roll of one pair of dice the chances of getting a "2" are one in six with a normal die. If the die is loaded (an example of influence by an outside source), the law of chance, or probability, is no longer the controlling factor. These are examples that are so easily understood that we take them for granted.

Suppose we take ten coins and toss them one at a time. We will get a certain number of heads and this number could be anything from zero to ten. But if we repeat our tossing of the ten coins four-hundred times, we begin to get a good picture of how the laws of probability affect an operation. Common sense tells us that in four-hundred tosses of the ten coins we should get five heads more often than any other possible number, but it is more difficult to say exactly how many times we can expect to get, say, three heads or nine heads.

We actually tossed ten pennies four-hundred times (Figure 1). In the table beside the graph you will note that five heads came up 103 times. There were progressively fewer cases of four or six heads, three or seven, two or eight and one or nine heads, and there were no cases of zero or ten heads. Plotting the frequency of occurrence against the number of heads observed gives us the very nearly symmetrical graph of Figure 1.

This curve is called a frequency distribution and is typical of the variations caused by chance alone. What does probability theory tell us? We said that in tossing ten coins four-hundred times we would expect to get five heads more often than any other number. We would also expect that the average number of heads in all four-hundred tosses would be five; the actual average obtained in the experiment was 5.03. Naturally, the larger the number of tosses, the more

Control Charts

nearly the average will approach 5.00 until, with an infinite number of tosses, the average would be 5.00.

Probability theory also can tell us how many times we could theoretically expect to get any number of heads in our coin tossing experiment, and this theoretical number is plotted as the dotted curve in Figure 1. This theoretical curve is called a "probability curve" or "normal distribution". It is important because it permits us to predict mathematically how often a given event may be expected to occur due to chance alone.

In analyzing data from a test, we can determine how often a given reading would occur by chance. If its actual frequency of occurrence is vastly different from the theoretical occurrence, we can safely conclude the reading could not have occurred merely by chance and must have had findable cause for its occurrence.

3. *What Standard Deviation Means.* An arithmetic average tells us much but does not show how readings vary among themselves. A measure of dispersion, or variation, is therefore of considerable aid because it does just this.

The measure of dispersion that has been most widely used in statistical analysis is the "standard deviation", designated by the Greek letter sigma, σ. The standard deviation of a set of N number of readings is defined mathematically as the square root of the sum of the squares of individual deviations divided by the number of readings, or symbolically:

$$\sigma = \sqrt{\frac{\Sigma\ (d^2)}{N}}$$

Standard deviation is a most useful tool. It can be shown that, when the variation of reading is due to chance, 68% of the readings will lie between plus and minus σ from the average. Ninety-five per cent of the readings will lie between plus and minus 2σ from the average and 99.7% of the readings will lie between plus and minus 3σ. This fact is illustrated in Figure 1.

With this information, we can predict whether a given process will meet specified tolerance limits. It can also give us warning before the limits are actually

(More on next page)

No. of Heads	Freq f	Dev. From M d	d^2	$f(d^2)$
0	0	-5	25	0
1	5	-4	16	80
2	14	-3	9	126
3	43	-2	4	172
4	82	-1	1	82
5	103	0	0	0
6	89	+1	1	89
7	44	+2	4	176
8	15	+3	9	135
9	5	+4	16	80
10	0	+5	25	0
Sum	400			940

$$\sigma = \sqrt{\frac{\Sigma f(d^2)}{N}} = \sqrt{\frac{940}{400}}$$

$\sigma = \sqrt{2.350} = \pm 1.533$

$2\sigma = \pm 3.066$

$3\sigma = \pm 4.600$

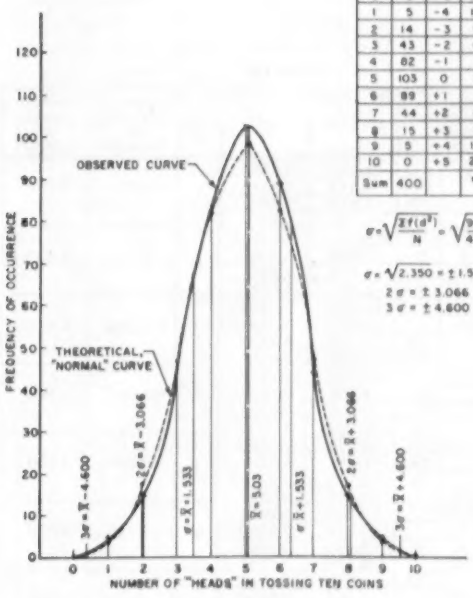

OBSERVED CURVE
THEORETICAL, "NORMAL" CURVE
FREQUENCY OF OCCURRENCE
NUMBER OF "HEADS" IN TOSSING TEN COINS
$\bar{X} = 5.00$
$\sigma = \bar{X} \pm 1.533$
$2\sigma = \bar{X} \pm 3.066$
$3\sigma = \bar{X} \pm 4.600$

FIGURE 1

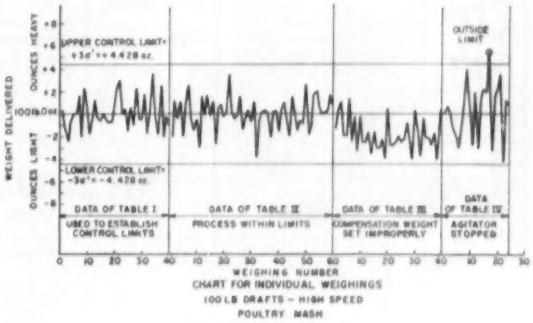


FIGURE 2

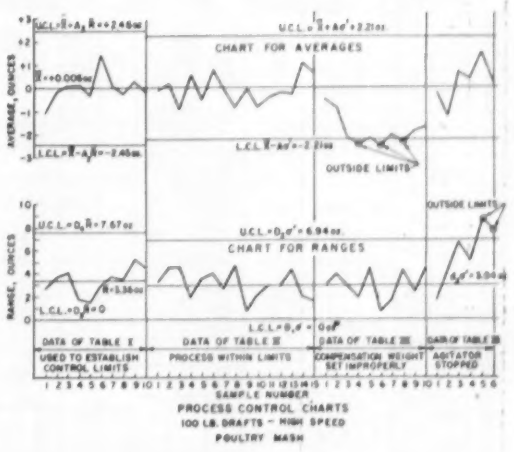


CHART FOR AVERAGES
AVERAGE, OUNCES
U.C.L. = $\bar{\bar{X}} + A_2\bar{R}$ = +2.46 oz.
U.C.L. = $\bar{\bar{X}} + A\sigma'$ = 2.21 oz.
$\bar{\bar{X}}$ = +0.006 oz.
L.C.L. = $\bar{\bar{X}} - A_2\bar{R}$ = -2.46 oz.
L.C.L. $\bar{\bar{X}} - A\sigma'$ = -2.21 oz.
OUTSIDE LIMITS
CHART FOR RANGES
RANGE, OUNCES
U.C.L. = $D_4\bar{R}$ = 7.67 oz.
U.C.L. = $D_4\sigma'$ = 6.94 oz.
$\bar{R}$ = 3.36 oz.
L.C.L. = $D_3\bar{R}$ = 0
L.C.L. = $D_3\sigma'$ = 0
OUTSIDE LIMITS
$A_2\sigma'$ = 3.04 oz.
DATA OF TABLE II
USED TO ESTABLISH CONTROL LIMITS
DATA OF TABLE III
PROCESS WITHIN LIMITS
DATA OF TABLE III
COMPENSATION WEIGHT SET IMPROPERLY
DATA OF TABLE III
AGITATOR STOPPED
SAMPLE NUMBER
PROCESS CONTROL CHARTS
100 LB. DRAFTS - HIGH SPEED
POULTRY MASH

FIGURE 3

Continued

TABLE I

WEIGH. NO.	WEIGHT ERROR IN HOPPER (OUNCES) HEAVY	LIGHT	DEVIATION FROM AVERAGE d (OUNCES)	d^2	SAMPLE NO.	SAMPLE AVERAGE $\bar{X}$ (OUNCES)	SAMPLE RANGE R (OUNCES)
1	1/4		+0.244	0.0595			
2		1 1/4	-1.256	1.5775	1	-1.063	2.750
3		2 1/2	-2.506	6.2800			
4		3/4	-0.756	0.5715			
5		1/8	-0.131	0.0172			
6	0	0	-0.006	0.0000	2	-0.125	3.625
7	1 1/8		+1.619	2.6212			
8		2	-2.006	4.0240			
9	2 1/4		+2.244	5.0355			
10	3/8		+0.369	0.1362	3	+0.094	4.000
11		1 3/8	-1.756	3.0835			
12		1/2	-0.506	0.2560			
13	1 1/4		+1.244	2.7915			
14		1/4	-0.256	0.0655	4	+0.125	1.750
15		1/2	-0.506	0.2560			
16	0	0	-0.006	0.0000			
17		1/2	-0.506	0.2560			
18		3/4	-0.756	0.5715	5	-0.313	1.500
19		3/4	-0.756	0.5715			
20	3/4		+0.744	0.5536			
21	2 1/4		+2.244	5.0355			
22	3		+2.994	8.9640	6	+1.406	3.000
23	0	0	-0.006	0.0000			
24	3/8		-0.369	0.1362			
25		1 1/2	-1.506	2.2680			
26	1/2		+0.494	0.2440	7	+0.063	3.750
27		1	-1.006	1.0120			
28	2 1/4		+2.244	5.0355			
29		1/2	-0.506	0.2560			
30		1/2	-0.506	0.2560	8	-0.250	3.500
31	1 3/4		+1.744	3.0415			
32		1 3/4	-1.756	3.0835			
33	0	0	-0.006	0.0000			
34	3 1/2		+3.494	12.2080	9	+0.313	5.250
35		1/2	-0.506	0.2560			
36		1 3/4	-1.756	3.0835			
37	2 1/2		+2.494	6.2200			
38		2	-2.006	4.0240	10	-0.188	4.500
39		1/4	-0.256	0.0655			
40		1	-1.006	1.0120			
SUM	22 5/8	22 3/8		84.9289		+0.062	33.625

AVG. WT. ERROR; $\frac{\Sigma}{N} = +\frac{0.25}{40} = +0.006$ oz. $\quad \sigma' = \sqrt{\frac{84.9289}{40}}$

$\sigma = \pm 1.457$ oz.

$\sigma' = \pm 1.476$ oz.

$\bar{\bar{X}} = 0.006$ oz. $\quad \bar{R} = 3.363$ oz.

TABLE II

WEIGH. NO.	WEIGHT ERROR IN HOPPER (OUNCES) HEAVY	LIGHT	SAMPLE NO.	SAMPLE AVERAGE X (OUNCES)	SAMPLE RANGE R (OUNCES)
1		1/2			
2	1 1/4		1	-0.063	3.250
3		1/2			
4	1				
5		2			
6	3/8		2	+0.188	4.500
7	2 1/2				
8		1/2			
9		1 1/2			
10		1/2	3	-0.875	4.500
11		3			
12	1 1/2				
13		1/8			
14	1 5/8		4	+0.563	1.875
15		1/4			
16	1				
17		2 3/8			
18	1/2		5	-0.500	3.500
19	3/4				
20		1/2			
21	0	0			
22	3 1/2		6	+0.781	4.000
23	1/8				
24		1/2			
25		1/8			
26	1 1/2		7	-0.094	2.875
27		1 3/8			
28		3/8			
29	1/4				
30		5/8	8	-0.781	4.750
31	1				
32		3 3/4			

WEIGH. NO.	WEIGHT ERROR IN HOPPER (OUNCES) HEAVY	LIGHT	SAMPLE NO.	SAMPLE AVERAGE X (OUNCES)	SAMPLE RANGE R (OUNCES)
33		1/2			
34	1/8		9	0.000	0.750
35	1/4				
36	1/8				
37		2			
38	1/8		10	-0.781	2.175
39	1/8				
40		1 1/2			
41	1/8				
42	1		11	-0.375	3.000
43		5/8			
44		2			
45	1 1/2				
46		1/8	12	-0.188	3.000
47		1 1/2			
48		3/8			
49		7/8			
50	2 5/8		13	-0.250	4.375
51		1 3/4			
52		1			
53	1 3/4				
54	2		14	+1.063	2.000
55	1/2				
56	0	0			
57	1/8				
58	1/4		15	+0.688	1.625
59	1 5/8				
60	3/4				

DATA TAKEN 1 MONTH AFTER TABLE I

exceeded in a running process. It works this way: a study is made of the process and about twenty-five or more successive readings taken. We then calculate the average reading and the standard deviation. We know that there are only three chances in a thousand that any reading will fall outside the limits of plus or minus 3σ from the average due to chance.

If these readings are within the tolerances permitted for the process, we can say that the process is capable of meeting the desired limits. If, now, we take a small group of sample readings of the process from time to time and find that each reading is within our previously-calculated 3σ values, we can say that the process is still operating satisfactorily.

If any readings fall outside our 3σ limits we know either that the new variations are caused by something other than chance, or that the process average has shifted. We may then take steps to find the cause. If the permissible tolerances for the process are broader than the 3σ limits, we are in a position to make corrective adjustments well before the process has actually produced unacceptable results.

Making Up a Control Chart

Any process or operation is subject to the laws of probability, and this is just as true of weighing as it is of tossing a coin. We know that, if we have an automatic scale properly adjusted, we will not always weigh-out the exact-same amount of material on successive weighings. Some weighings are slightly heavy and others light. As long as the scale is operating correctly, these variations may be considered due to chance. A record of a large number of them would produce a curve similar to Figure 1.

Let's consider an actual case of an automatic bagging scale making 100-pound weighings of poultry mash at high speed. Forty test weighings were taken and each measured to the nearest eighth of an ounce with results as shown in Table I. The average weighing was 0.006 ounces heavy, but individual weighings differed from the average as much as 3½ ounces. Our problem is to determine the accuracy of this scale and make up a control chart. With the chart we may then detect whether this accuracy is maintained continually.

Determining Standard Deviation of Individual Weighings:

In Table I are listed the deviations from the average and the squares of the deviations. From this, σ is determined by Equation (1) for the forty test weighings observed.

To make this a little more general, we use the relationship:

$$\sigma' = \sigma\sqrt{\frac{N}{N-1}}$$

in which σ is the standard deviation of the sample of

N number of readings and σ' is the expected or theoretical standard deviation whcih would result in taking an infinitely large sample from the same "population".

σ' turns out to be 1.48 ounces. Therefore, by chance alone, any individual weighing will not differ from the average by more than thrice this, or 4.44 ounces, more often than three times in a thousand weighings.

The forty individual weighings observed in our test have been plotted on the left in Figure 2 and the limit lines at plus and minus $3\sigma'$ (4.44 ounces) drawn in. If we extend these limit lines and plot additional weighings, values should fall within the limit lines as long as the process remains in control. When points appear beyond these limits, the scale needs adjustment. Either the weighings are erratic or they are no longer averaging about the correct weight.

We tested the same scale a month after the initial study. Table II was made. These points were plotted in Figure 2, and the limit lines, established from the first test, extended. Note that all sixty weighings fall well within the limits of $\pm 3\sigma'$ and seem to oscillate uniformly about the desired 100-pound value. This shows that the scale is still operating in a state of good control.

To illustrate the sensitivity of statistical control charts in detecting abnormal conditions, the data of Tables III and IV were taken. In Table III the compensation weight (governing the allowance made for the weight of the falling column of material at the instant the scale beam reaches balance) was intentionally fixed to produce light weighings. The weighings are plotted in Figure 2. No points fall outside the limit lines, but there is a visible shift in the average level of points.

In Table IV the compensation weight was reset. But the weigh hopper was purposely stopped. These readings are also plotted in Figure 2. The weighings are erratic. One point falls outside the upper control limit. However, note that the average weighing is approximately correct.

Determining "Average" and "Range" Control Limits:

The chart for individual weighings (Figure 2) is the simplest form of control chart. It serves to warn but it does not necessarily tell you "findable causes" are altering the process. For this reason, the more sensitive charts for averaging ($\overline{X}$) and ranges (R) are often used (Figure 3).

In constructing $\overline{X}$ and R charts, a number of small sample weighings, called sub-groups, were taken. The average value and range of values of each sub-group were determined. The usual sub-group size is four weighings. After finding the average and range for each of the ten sub-groups shown in Table I, the grand average $\overline{\overline{X}}$ and the average range, $\overline{R}$, also were computed.

We then set up trial control limits for the average $\overline{X}$ and R instead of the individual weighings. This is simply a matter of arithmetic. Statistically, the upper and lower limits for averages are given by $\overline{\overline{X}} +/- A_2\overline{R}$, respectively, and the upper and lower limits for ranges are given by $D_4\overline{R}$ and $D_3\overline{R}$, respectively.

The quantities A_2, D_3 and D_4 are derived from σ and depend on the sub-group size. They are standard statistical symbols and are listed in Table V. The left side of Figure 3 shows the charts made as a result of our initial test of Table I, and the appropriate limit lines have been drawn in. Note that it is customary to place the $\overline{X}$ chart directly over the R chart for ready comparison.

None of the points taken from Table I lies outside the limit lines on either the $\overline{X}$ or R chart, indicating that the process is in control. Whether the limits of

(Continued on page 112)

TABLE III

COMP. WEIGHT SET IMPROPERLY					
WEIGH NO.	WEIGHT ERROR IN HOPPER (OUNCES) HEAVY	LIGHT	SAMPLE NO.	SAMPLE AVERAGE $\overline{X}$ (OUNCES)	SAMPLE RANGE R (OUNCES)
1		1 1/8			
2	1/4		1	-0.500	3.000
3	1				
4		2			
5		2			
6	1 1/2		2	-0.813	4.000
7		2 1/2			
8		1/4			
9		3 1/4			
10		1/4	3	-2.125	3.000
11		2 1/2			
12		2 1/2			
13		1 3/8			
14		3 1/2	4	-2.406	2.000
15		1 1/2			
16		3			
17		3			
18		2 1/4	5	-2.188	4.500
19		4			
20	1/2				
21		2 3/4			
22		2 3/4	6	-2.500	0.750
23		2 1/2			
24		2			
25		2 1/2			
26		2 1/4	7	-2.000	1.750
27		3/4			
28		2 1/2			
29		4			
30	1/4		8	-2.281	4.250
31		1 3/8			
32		3 3/4			
33		5/8			
34		2	9	-1.813	2.375
35		2 1/8			
36		2 3/4			
37		1 3/4			
38		4	10	-1.625	4.500
39		1 1/4			
40	1/2				

TABLE IV

AGITATOR STOPPED					
WEIGH NO.	WEIGHT ERROR IN HOPPER (OUNCES) HEAVY	LIGHT	SAMPLE NO.	SAMPLE AVERAGE $\overline{X}$ (OUNCES)	SAMPLE RANGE R (OUNCES)
1	0	0			
2	1/2		1	-0.188	1.750
3	0	0			
4		1 1/4			
5		2			
6		3	2	-1.219	4.125
7		1			
8	1 1/8				
9	4				
10		1/4	3	+0.719	6.750
11		2 3/4			
12	1 7/8				
13		3 1/8			
14	1		4	+0.469	5.250
15	2 1/8				
16	1 7/8				
17	5 1/2				
18		3 1/4	5	+1.531	8.750
19	1 5/8				
20	2 1/4				
21	3 1/2				
22		4 1/8	6	+0.281	7.750
23	1 1/8				
24	3/4				

TABLE V

SHEWHART CHARTS FOR AVERAGES

	CONSTANTS FOR COMPUTING CONTROL LIMIT FOR AVERAGE AND RANGE TO SEE IF AN UNKNOWN PROCESS IS IN CONTROL			CONSTANTS FOR COMPUTING LIMIT LINES TO DETERMINE IF A KNOWN PROCESS REMAINS IN CONTROL			
NUMBER OF OBSERVATIONS IN SAMPLE n	FACTOR FOR $\overline{X}$ CHART A_2	FACTORS FOR R CHART LOWER CONTROL LIMIT D_3	FACTORS FOR R CHART UPPER CONTROL LIMIT D_4	CHART FOR AVERAGES CONSTANT FOR CONTROL LIMITS $A(=3/\sqrt{n})$	CHART FOR RANGES CONSTANT FOR CENTRAL LINE d_2	CHART FOR RANGES CONSTANTS FOR CONTROL LIMITS D_1	CHART FOR RANGES CONSTANTS FOR CONTROL LIMITS D_2
2	1.88	0	3.27	2.12	1.13	0	3.69
3	1.02	0	2.57	1.73	1.69	0	4.36
4	0.73	0	2.28	1.50	2.06	0	4.70
5	0.58	0	2.11	1.34	2.33	0	4.92
6	0.48	0	2.00	1.23	2.53	0	5.08
7	0.42	0.09	1.92	1.13	2.70	0.20	5.20
8	0.37	0.14	1.86	1.06	2.85	0.39	5.31
9	0.34	0.18	1.82	1.00	2.97	0.59	5.39
10	0.31	0.22	1.78	0.95	3.08	0.69	5.47
11	0.29	0.26	1.74	0.90	3.17	0.81	5.53
12	0.27	0.28	1.72	0.87	3.26	0.92	5.59
13	0.25	0.31	1.69	0.83	3.34	1.03	5.65
14	0.24	0.33	1.67	0.80	3.41	1.12	5.69
15	0.22	0.35	1.65	0.77	3.47	1.21	5.74
16	0.21	0.36	1.64	0.75	3.53	1.28	5.78
17	0.20	0.38	1.62	0.73	3.59	1.36	5.82
18	0.19	0.39	1.61	0.71	3.64	1.43	5.85
19	0.19	0.40	1.60	0.69	3.69	1.49	5.89
20	0.18	0.41	1.59	0.67	3.74	1.54	5.92
	CHART FOR AVERAGES: CENTRAL LINE IS AT $\overline{\overline{X}}$; UCL = $\overline{\overline{X}} + A_2\overline{R}$; LCL = $\overline{\overline{X}} - A_2\overline{R}$ CHART FOR RANGES: CENTRAL LINE IS AT $\overline{R}$; UCL = $D_4\overline{R}$; LCL = $D_3\overline{R}$			CHART FOR AVERAGES: CENTRAL LINE IS AT $\overline{\overline{X}}$; UCL = $\overline{\overline{X}} + A\sigma'$; LCL = $\overline{\overline{X}} - A\sigma'$ CHART FOR RANGES: CENTRAL LINE = $d_2\sigma'$; UCL = $D_2\sigma'$; LCL = $D_1\sigma'$, (σ' = EXPECTED VALUE OF σ)			

ROVING FOREMAN uses his set to coordinate activities of all material handling vehicles operating between warehouses and shipping docks.

Radio Direction Steps Up Equipment

Customers get better, faster service, and material handling has become much more efficient as industrial radio keeps all operations in close touch over a 70-acre area.

GREATER warehousing flexibility was the aim of Ball Brothers Co., Inc., when industrial radio was installed at their Muncie, Ind., plant. And, according to Louis W. Fox, superintendent of the Shipping, Warehousing and Material Handling Department, the system has been instrumental in increasing the overall utilization average of his vehicles to about 80 percent.

The radio controlled warehousing and shipping system—which went into operation in March, 1954—has coordinated all operations over the 70 acre plant to provide a better and much faster service to container customers than was previously experienced.

Ball makes not only the widely known Mason fruit jar for home canning but also many of the commercial glass containers used by the food, beverage, drug and cosmetic industries. The Muncie plant includes two container production areas, 17 warehouses and two loading docks—one for truck carriers, the other for freight cars.

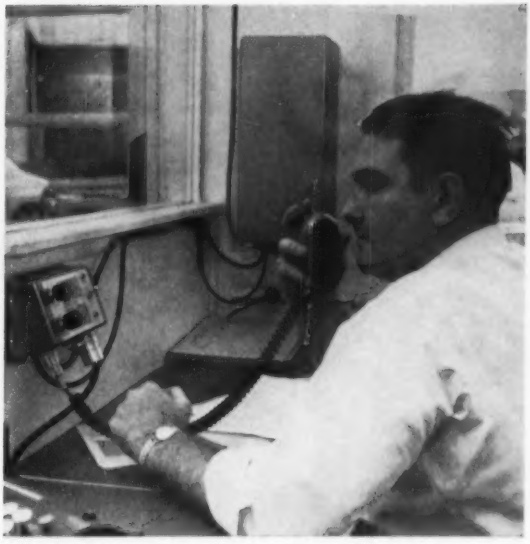
The output of the two glass plants is boxed, palletized, then moved onto trailers by forklift trucks. Two or more of these trailers form a "ware train." Industrial tractors pull the trains into warehouses where ware is pallet-stacked for future shipment, or haul them directly to loading docks for immediate shipment. The firm considered three things in a three-year study of their product-handling system before deciding that two-way radio would be part of the answer to the need for streamlining and speeding up their entire warehousing and shipping system.

Several Types Required

First, several types of containers produced by Ball are required seasonally. Also, commercial container purchasers time their deliveries close to actual production requirements. These two factors often make it necessary for Ball to produce containers in advance and warehouse them for future shipment.

The third factor has been the Company's steady ex-

IN TRANSFER of cases from production centers and warehouses to trailer trains, delays are minimized as radio-equipped tractors can be called as desired.



BASE STATION in office of Superintendent normally does not control trucks but operates on same frequency, allows office to locate personnel throughout plant.

Utilization

INSIDE or outdoors, rapid communication assures payloads. Over-all utilization of mobile equipment at Ball has been increased to a healthy 80 percent.

pansion, accompanied by an ever-increasing daily handling of ware and a great increase in the number of rush orders.

Because of its speed and easy mobility, two-way radio was indicated, and all tow tractors and order filling lift trucks were so equipped.

Although no central dispatcher is used in the radio system, a base station is set up in the office of the Shipping, Warehousing and Materials Handling Department. This radio operates on the same frequency as all the mobile radios on the material handling trucks, and serves as a monitor for the office. In addition, it is used for occasional emergency calls to locate individuals around the plant and for sending extremely urgent orders and instructions.

The order-filling lift truck operators and tow truck operators pick up orders for deliveries for their shift when they report for work. As each driver needs assistance, he uses the radio to call for it. A material handling foreman roves about the plant areas in a radio-equipped tow truck, lending assistance and advice where needed to keep the containers flowing smoothly.

All radios are turned on at all times so that any message sent out by one of the operators has the attention of all the other operators. If an order-filling operator needs additional trailers for his immediate order—or a tow truck operator wants to know where he is needed—he merely asks for what he wants over the radio. The request for information or help is filled immediately.

Because each operator may request what he needs from anywhere in the plant area, at once, when he needs it, deadheading has been virtually eliminated and the desired flexibility of operation has been achieved.

Pictures and data courtesy General Electric Company.

What It Takes To Make

By John D. Rumsey*

IN material handling, "automation" means the automatic handling of parts or assemblies between progressive production processes. Stated in another way, it consists of relating, coordinating, and integrating machines, controls, and processes to the extent that processing (partial or complete) flows from the primary state to the useful end-product automatically, without use of human hands.

FIG. 1. Transfer of heavy part from roller conveyor to power & free system. Block is secured on carrier.

Properly designed automation will produce these advantages:

1. Increase production per unit of time.
2. Lessen processing space required per unit.
3. Reduce "in-process" inventory to a new low.
4. Keep "in-process" inventory on "first-in, first-out" basis.
5. Produce a considerable drop per unit in labor costs.
6. Lessen chance for scrap or waste.
7. Maintain more uniform results because of minimum dependence upon the human element.

Disadvantages produced by continuous automation handling include:

1. Increasingly costly down-time, regardless of cause.
2. Larger money investment required.
3. Increased need for more highly skilled maintenance men.

Down-time is a growing concern as more and more operations are being combined in automatic programs. It can be very costly because it is cumulative. For example, every delay occurring in one section of an automated sequence will shut down all other parts. We thus have a high premium on dependability. Some plants are using "Segmented Automation" in order to minimize the high cost of down time on large automation jobs.

Down time is broken into two basic classifications:

1. Predictable down-time—such as in changing tools, cleaning a machine, preventive maintenance, etc.
2. Non-predictable down-time—such as lost time resulting from breakdowns.

Mr. Rumsey, Chief Engineer of Jervis B. Webb Company, candidly itemizes some advantages and disadvantages to be expected from continuous automatic flow systems and tells how undesirable aspects can be reduced to minimum

Automation Pay

Great strides are being made to eliminate unnecessary down-time from predictable causes. A scheduled program for changing tools before they are worn out or broken, cleaning machines, proper lubrication, etc., can be carried out during lunch hours, or on shifts when the production department is down.

Non-predictable down-time is usually due to poor design. It may be eliminated if engineers make equipment more simple, more rugged, and with safety mechanisms to prevent abuse and misuse of equipment. Preventive maintenance will help minimize breakdowns.

The second disadvantage—increased investment—is most often overcome by increased savings. Automatic handling equipment should be designed with an eye to possible future changes in the product so that equipment life may be extended to maximum.

The third disadvantage—the requirement for more highly skilled maintenance men—may be minimized by the design of simple, sturdy equipment, design with consideration for easy maintenance and repair.

Comprehensive Outlook Required

It is first necessary to determine the best engineering and economic approach to any problem. The open mind and willingness to question, the application of real thought to the whole problem, are required for successful automation. Can a product be simplified and redesigned to be more easily processed or manufactured, and still function properly? How about the number of pieces and number of operations that go into a product—are they all necessary?

Investigate all the related factors in choosing a basic equipment design. If only one unit is to be built, the design thinking and equipment selection may be different than if a large number of duplicate units are to be made. Is the equipment to be in good or bad en-

(More on next page)

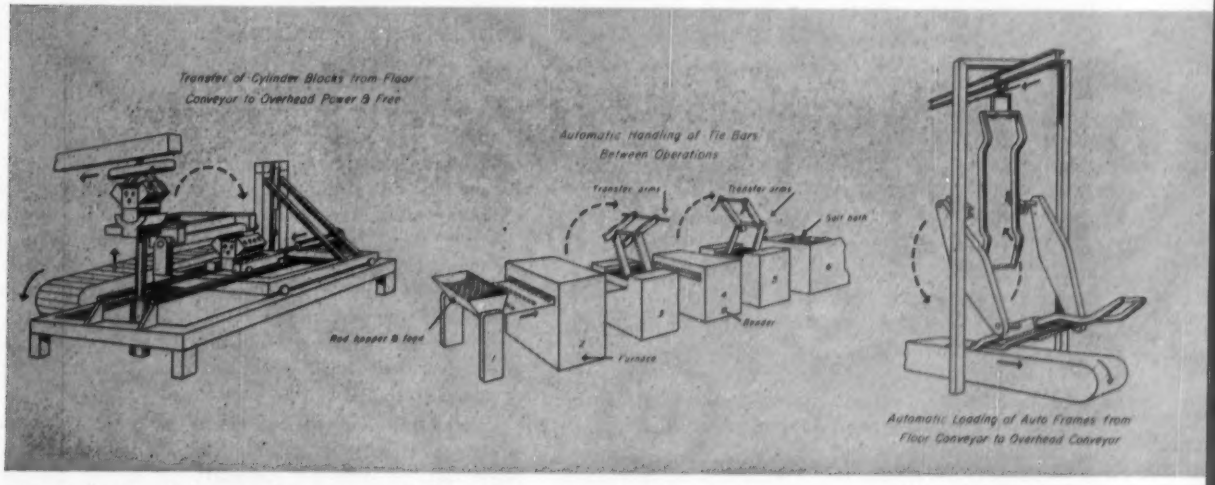

Transfer of Cylinder Blocks from Floor Conveyor to Overhead Power & Free
Automatic Handling of Tie Bars Between Operations
Transfer arms
Transfer arms
Split bath
Heater
Furnace
Rod hopper & feed
Automatic Loading of Auto Frames from Floor Conveyor to Overhead Conveyor

FIG. 2. Limit switches regulates transfer from floor to overhead conveyor.

FIG. 3. Clamped and rotated by arms, motors are lifted onto overhead carriers.

FIG. 4. Mechanized handling for a sequence of operations.

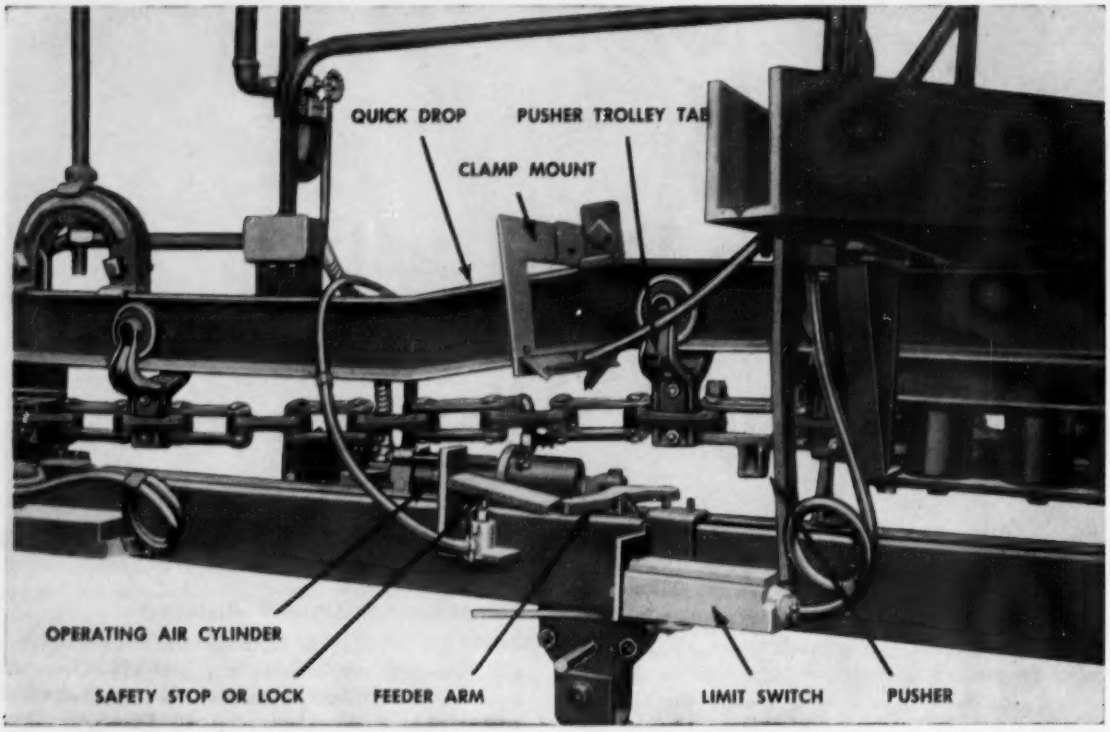


FIG. 5. Example of the conveyor system, with long-arm limit switch having flexible cord, quick disconnect plug.

AUTOMATION

Continued

vironment, such as in a laboratory or foundry? Will it be located where temperatures may vary widely or be subject to the weather?

It is important to get an idea of the life expectancy desired from equipment. How much abuse and misuse is it likely to receive? Is it desirable to have extra "eye appeal" where an operation is visible to many visitors?

The relation of this equipment to other equipment in the production line must receive proper consideration. Decisions as to design and selection of component equipment should be conditioned by necessary interlocks, inter-changeability of parts and components where required, and the possibility of standby equipment. These are some of many factors that will affect the basic design of the automation equipment.

The design should be simple. The use of standard equipment is often better than special equipment—for example, some customers prefer to have a standard motor coupled with a floor-mounted brake in place of a combination brake motor. Ease of repair and stocking of standard parts are factors in this decision. Sometimes, however, the best mechanization may not be obtained if it is based upon the use of standard equipment or machine tools. The object is not necessarily to apply the tools we may already have but rather to develop the best equipment for the particular job in mind.

Equipment must be made sturdy. It will be subject to abuse and misuse, and dependability is a prime factor in good automation equipment.

Equipment must be designed with easy maintenance in mind. Easy accessibility and easy replacement of parts is necessary. As examples, solenoid valves should be wired with a short flexible cord and plug; hose connectors should be installed between the air supply valves and the cylinders, making the changing of the solenoid valves, for maintenance purposes, a simple and fast matter. Solenoid valves should have provision for manual operation by a small rod inserted through a hole in the housing. This permits a determination as to whether solenoid trouble is electrical or pneumatic.

It is essential that a machine may be easily and properly lubricated. It is important that equipment be designed so that it can be kept clean.

Consideration of various needs for adjustment of equipment is most important. After equipment is first assembled, it may be necessary to adjust certain component parts. Or, after equipment has been running a long time, it may be necessary to adjust again to

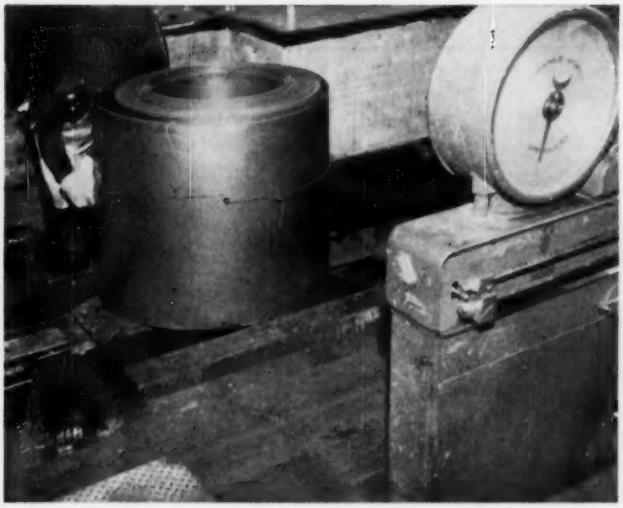


FIG. 6. Automatic weighing of coils on floor conveyor. Man in background ties roll together with wire.

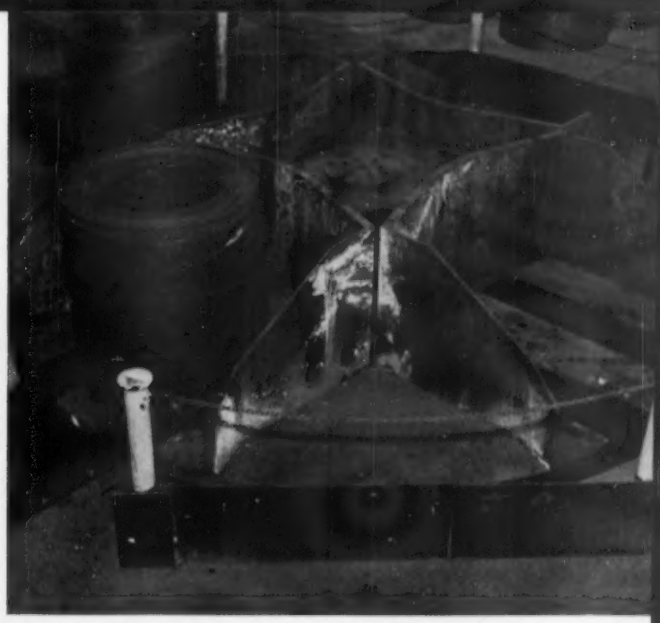


FIG. 7. Rotary transfer mechanism handles steel coils between two floor conveyors for 90 degree turn.

take care of possible wear. Within reason, it is possible to accommodate subsequent changes in the design of the parts if adjusts are available.

Control Placement Takes Extra Thought

Selection and location of electrical controls are very important to the proper operation of equipment. It often takes extra thought to properly place limit switches where they can do a dependable job and, at the same time, be protected from damage and available for service. Here, again, we should try to use standard limit switches. It is preferred that they be consistently wired by a color or a code system, with quick detachable plugs. The conventional, precision limit switch—which is so ideally used on industrial equipment such as machine tools—is of little value in some automation applications when loose tolerances are inherent. To meet these conditions, we have developed a limit switch with an actuating arm of large size and liberal overtravel. This mechanism has shown very good service in converting the large movements of the actuating arm to the small travel needed to depress the plunger of a precision switch.

Design should include ample clearances, particularly where moving parts are concerned; for example, if a part is to be set upon a saddle, a wide flared entrace plate is desirable to accommodate variations in part size or location.

Conservative speeds and cycles, with consideration for inertia involved, must be used. Acceleration and deceleration forces must be carefully checked.

Safeguards for Men, Machines and Parts

Safety is an important factor in automation equipment. Moving parts must be properly guarded, necessary additional limit switches and overload devices must be added to protect the men, the machine, and

(More on next page)

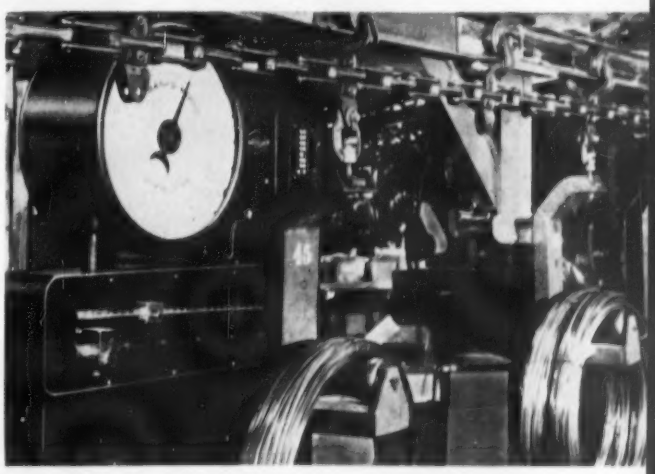


FIG. 8. Direct, in-transit weighing of material on overhead conveyor is allowed by vertical clearance.

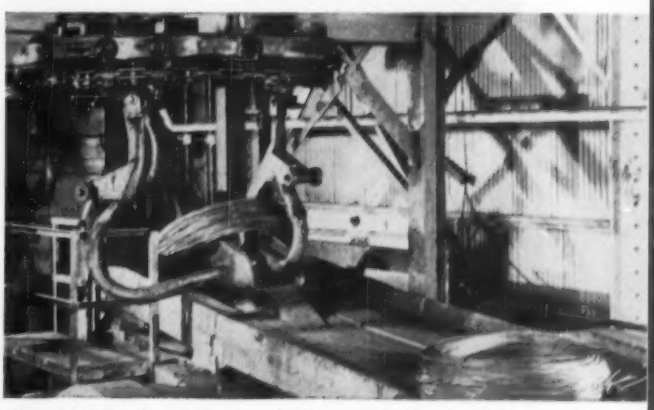


FIG. 9. Transfer of rod coils from drag to overhead conveyor synchronized mechanically & electrically.

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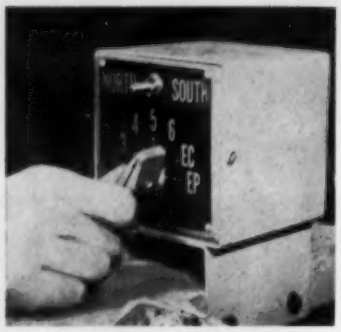

FIG. 10. Selector box allows operator to predetermined stations to which carriers are to be sent.

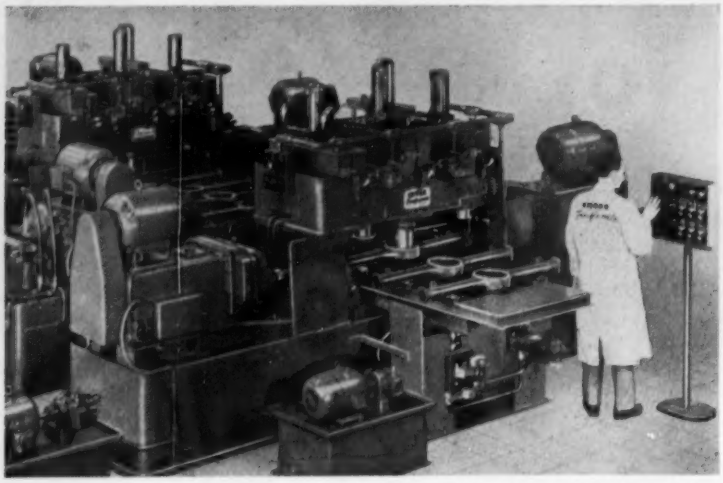

FIG. 12. "Walking beam" transfer method used during machining operations on long parts like axle shafts.

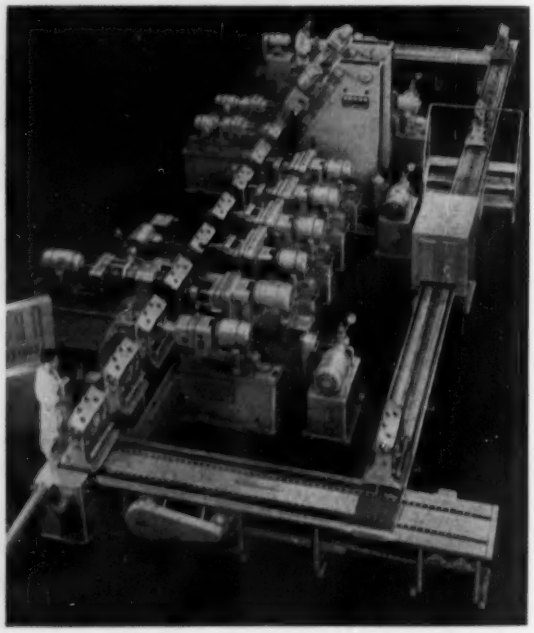

FIG. 11. Fixture return conveyor on transfermatic machine for automatic movement through operations.

the parts. It is very helpful in the original assembly of automatic equipment, as well as for subsequent maintenance, to have all component parts properly tagged or identified. All electrical limit switches, valve solenoids, etc., should have wires terminating in readily accessible panels for easy trouble shooting. Wiring diagrams and additional information necessary to properly maintain equipment should be posted nearby—for example, in the back of the cover of the control panel.

Since most mechanized equipment is special to the requirements of a particular process, it is important that the design engineers pay very close attention to minute details, which can become major considerations if they cause a shutdown.

Automatic Handling Between Operations

The following common methods of transfer are used separately or in combination to perform automatic handling of parts between operations:

1. Floor conveyors, such as slat and drag types.
2. Belt or wire mesh conveyors.
3. Overhead trolley conveyors.
4. Air or hydraulic cylinders.
5. The walking beam, consisting basically, of the following motions—up, forward, down, and return.
6. The shuttle bar, a reciprocating motion—pushing parts from top, side, or bottom, on slider or roller bed.
7. Vibrating or oscillating conveyors.
8. Pivoted or rotary mechanisms.

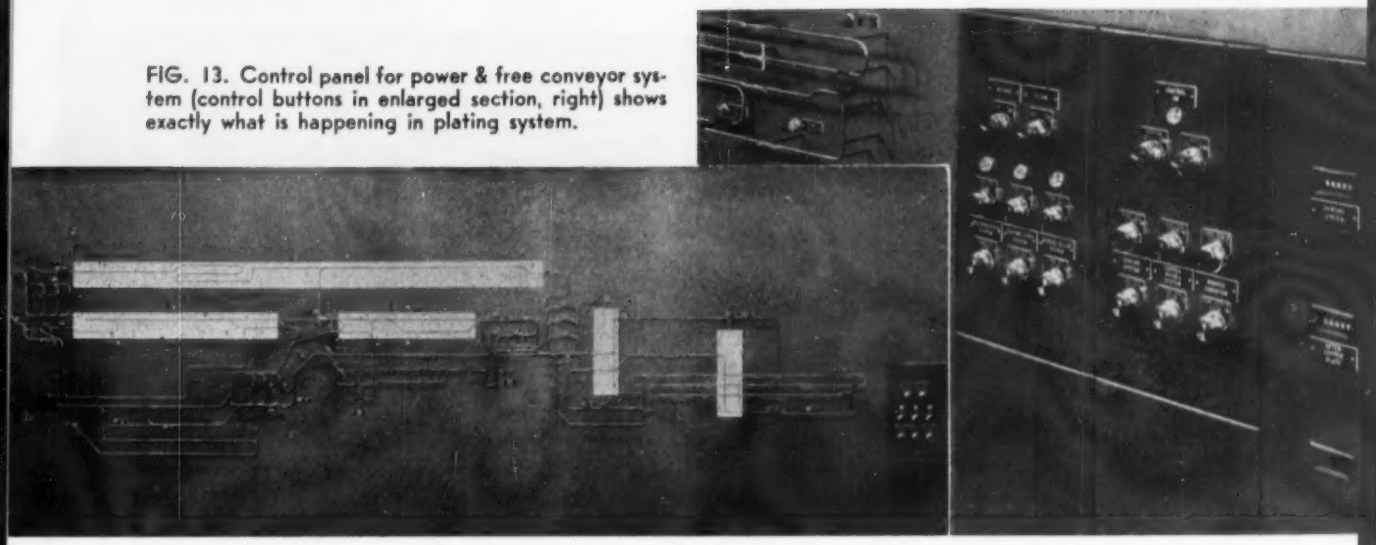

FIG. 13. Control panel for power & free conveyor system (control buttons in enlarged section, right) shows exactly what is happening in plating system.

Keep control of parts to be automatically handled. Loose parts are difficult to handle. Orientation devices cost money.

Typical Examples of Automatic Handling

Accompanying illustrations show a number of typical installations of automatic handling equipment.

In **Figure 1** is a fixture return conveyor on a large transfermatic machine. Here, parts are placed in a fixture, and the fixture and parts are moved through the various machine operations by means of a transfer bar. When machining is finished, the fixture is returned on a drag chain conveyor, which pushes the fixture on a slider bed. In some cases, parts are carried on offset roller chain.

Figure 2 illustrates the walking beam transfer method for parts like rear axle shafts. The main supporting structure for the parts is on V-rollers running on an inverted angle track. The whole structure is counterweighted; the lifting motion is obtained by a long shaft operating a number of pinions and racks. The horizontal motion is obtained by hydraulic cylinder.

Figure 3 shows the automatic transfer of steel rod coils from floor conveyor to overhead conveyor. Here may be seen an up-ender, tilting coil at the proper time so that a synchronized overhead carrier can spear the coil. Floor conveyor and overhead conveyor are synchronized by the use of DC electrical equipment, plus a mechanical tie to guarantee proper synchronizing.

In **Figure 4** an automatic rotary transfer mechanism handles steel coils between two floor conveyors 90 degree apart. The motion here starts as the coil is moved above the turn-table. The turn-table lifts up, rotates, and moves down to deposit coils on the second floor conveyor. Vertical lifting is accomplished, with a hydraulic cylinder, by a center shaft which, in turn, is properly splined so that mechanical connections provide the proper rotations of the table.

Figure 5 illustrates the automatic weighing of steel coils in transit on an overhead conveyor. Here, the trolley carrying the load is given sufficient clearance to move freely, vertically, within the chain, so that load may be read directly on the weighing beam of the scale.

Automatic weighing of coils on a floor conveyor is shown in **Figure 6.** Here, the coil is momentarily raised off the conveyor by the scale platform and, after weighing, is returned to the floor conveyor. The man in the background is only concerned with tying the roll together with wire.

Figure 7 is an example of the power & free conveyor system. Here, a power chain, supported on I-beam, travels continuously. The free trolleys, which support material being transported, move along a second track made of double channels and located below the first. Steel pushers, riding along the power chain, engage the free trolleys with pivoted dogs and propel trolleys with loads along the free track. These trolleys and carriers are introduced into the system at various desired stations—and subsequently are dispatched to different stations on branch tracks—without affecting the continuous circulation of the power chain. This picture is of a typical setup where a free trolley is in the process of being fed into contact with the pusher on the power chain at a quick drop. The setup prevents more than one free trolley from being propelled by one pusher. Also shown is the conveyor type limit switch—with its long arm to permit large overtravel and its flexible cord and quick disconnect plug for easy replacement.

The transfer of a motor block from roller conveyor on to a power and free conveyor is illustrated in **Figure 8.**

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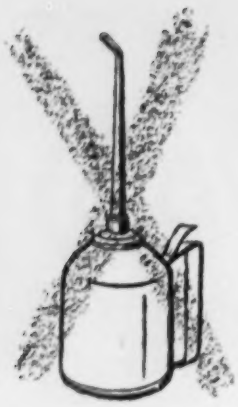
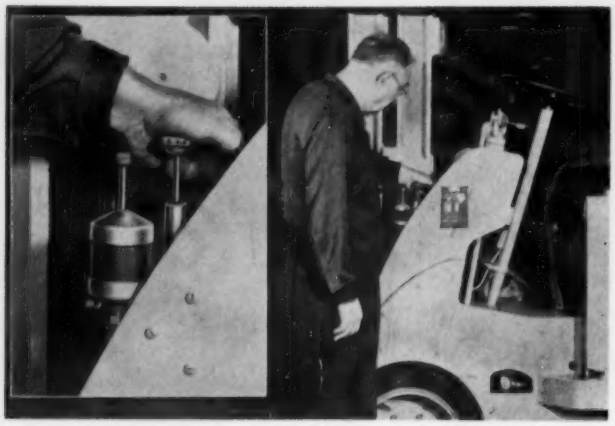




DRIVER OPERATED pump on fork truck lubricates all bearings with single stroke, has reservoir for 120 grease jobs, detects any troubles instantly.

Mechanized Maintenance

There'll be no place for oil cans in the automation age, the author says, as he discusses the significance and scope of centralized lubrication.

RAPIDLY increasing developments in the mechanization of material handling have made absolescent methods which rely on the human element for the lubrication-maintenance of machines.

We have available to us the finest lubricants in the world—and the finest machines yet developed. We recognize that down-time is becoming an increasingly intolerable condition. Mechanical failures, therefore, must be minimized through effective control of that most important maintenance function.

The essence of effective lubrication, as related to application, is in the word "control". The inadequacy of the oil can and the grease gun to meet today's machine lubrication requirements rests in the fact that they do not provide a single element of control. One can only *assume* that:

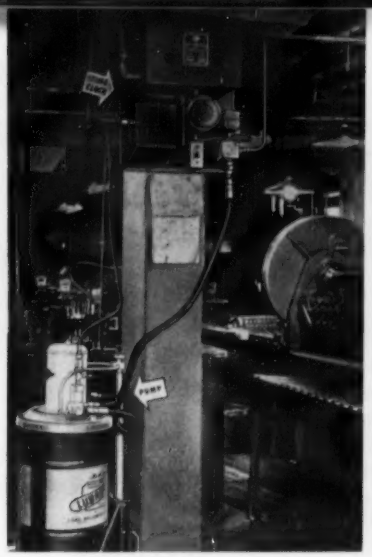
- **a.** The right lubricant has been selected for every bearing
- **b.** Every bearing will be located and contacted
- **c.** The proper amount of lubricant will be applied to each bearing
- **d.** Lubricant will be applied at proper time intervals
- **e.** As applied, lubricant will flow to the bearing
- **f.** Lubricant will be free of contamination.

Aside from the lack of control, the cost of the oil can and grease gun is threefold: (1) initial cost; (2) cost of carrying them around; and (3) cost of consequences resulting from the way they are used.

Bearing failure, due to improper lubrication—which is either application of insufficient, excessive or contaminated lubricant—results from slow, cumulative wear. The process cannot be readily detected from observation nor controlled by an exacting choice of lubricant or by establishing the most rigid instructions as to lubrication.

A recent survey made in a medium size, Mid-western plant illustrated the chaotic condition of its lubrication program—a situation far from uncommon. Metal washers painted white were placed on the various types of fittings, oil cups, wick feeders, etc., on each machine. Photographs were taken of over 50 of these machines, with each lubrication fitting set-off by the white markers. It was found that no machine had less than three different types of fittings. Some had five different types. It was not unusual to find one machine equipped with oil cups, and an identical machine in another department equipped with grease fittings and oil holes. All of these points had first to be located by the oiler, and then contacted with the proper kind of grease gun or oil can filled with the right kind of lubricant.

It was obviously impossible for the maintenance



CLOCK controlled air-operated pump serves both machines and conveyors.

OUTPUT upped 1440 units per shift at Twin Pines Dairy, Detroit, by centralized service.

FIVE STROKES of central pump lubricates 37 crane bearings—15 on bridge, 22 on trolley —at Heppenstall Co. Job takes 10 seconds.

# of Handling Equipment

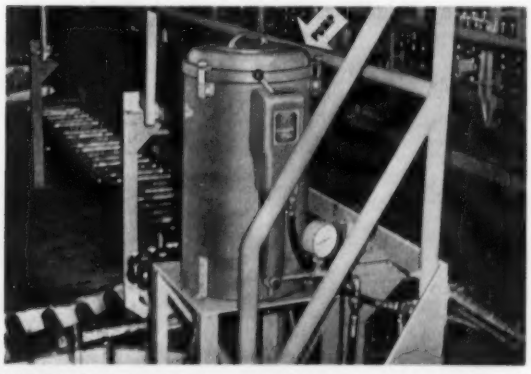
By L. C. Rotter
Chief Engineer
Lincoln Engineering Co.

men to handle this lubrication job with any degree of reliability and efficiency. As a result, there were frequent cases of burned-out-bearings—which were blamed on all kinds of causes—and an extremely high rate of costly machine down-time for lubrication and needless repairs.

Centralized Systems Provide Control

In contrast to individual contact methods, let us consider the degree of control provided by modern, centralized lubrication systems.

Stated in simplest terms, the centralized system comprises a lubricant pump and a series of hydraulic, force-feed measuring valves, or injectors, with provision for cycling all valves in an entire system, simultaneously—at predetermined time intervals—to insure the application of a measured amount of lubricant to each bearing under positive pressure.



PORTABLE bucket pump, air-motor operated, has eliminated bearing failure, breakage and jamming at Coca Cola plant. Here servicing case conveyor.

The pumping unit may be electrically or pneumatically power-operated, or hydraulically or manually operated. It may deliver lubricant from either an original refinery container, an independent reservoir—as in the case of certain hydraulic units—or from a self-contained reservoir. Power-operated pumps can be provided with time clocks to automatically control the time interval of the lubrication cycle.

Lubricant is forced from the pump through a supply line to the injector valves, usually mounted on the machine in manifolds of from two to five valves—from which seamless steel tubing, or flexible feeder lines, extend and are attached permanently to each bearing in the system. Each injector is equipped with a visible indicator and an external manual adjustment to insure the application of proper lubricant—in measured quantities, suited to each bearing requirement—every time the system is cycled.

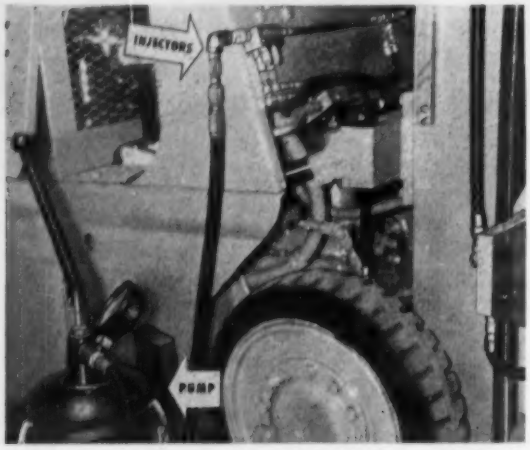
Manually operated pumping units are recommended for single machine lubrication. Power-operated pumping units, delivering lubricant from original 400- or 120-pound refinery containers, are recommended for mass lubrication of from five to 50 machines located in a single zone. The supply line of each machine in the zone is connected into a header line which terminates at the pump. The circuits of injectors on all machines in the zone are supplied from this single, centrally located pump. The pump can be time-clock controlled so that the systems on all machines in the zone will

(More on next page)

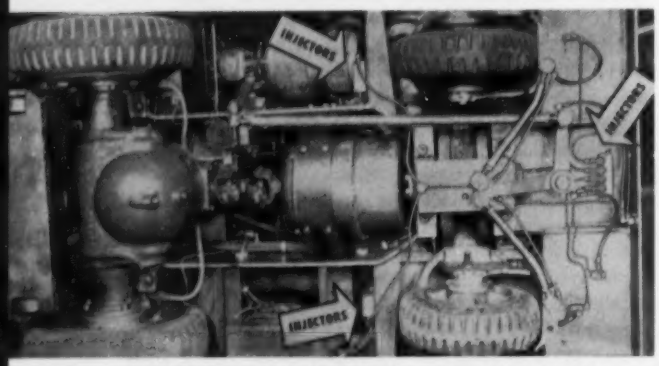
Continued

be automatically cycled, simultaneously, at any interval desired—from one minute to eight hours.

If one or more machine in the zone are not in use, they can be cut out of the mass lubrication system by means of manually or electrically operated shut-off valves incorporated in the supply line of each machine.



SIXTY-SECOND grease job by portable bucket pump which feeds centralized system of fork truck at pressure of some 2,500 psi. to reach tightest joints.



LUBRICATING LINES of electric truck system in view showing some injectors, which have visible indicator and external, manual adjustment.

FULLY AUTOMATIC, time-controlled system at Hanna Coal Co. includes take-up idlers of belt conveyors, almost eliminated bearing failures.

An alarm signal in the time clock provides a safety device by automatically warning when lubricant level in the drum is low, or if a break in the supply line has occurred.

From this brief description, one can see how centralized systems provide the essential elements of control over application. For example . . .

1. The right lubricant, as pertains to all bearings served by a centralized system, is determined from the data acquired by testing different lubricants for performance characteristics while exposed to actual operating conditions.

2. Knowledge of the **lubricant capacity** of a bearing need not rely upon mathematical or theoretical calculations since, with the displacement adjustment of the injector valve, this information can be determined conclusively.

3. A film of clean **lubricant can be permanently maintained** on all bearings. Each bearing is certain to receive the **intended lubricant** in the **predetermined quantity** and at the **specified time interval** by means of the selective setting of the pressure developed by the central pump.

4. Contamination is eliminated when lubricant is from an original refinery container through the sealed injector circuit direct to the bearings.

Let us see how centralized lubrication systems affect operating costs.

In contrast with the three-fold cost of the individual contact method, the centralized system involves just one cost. The initial cost is the total cost. There can be no cost in carrying it around as it is permanently installed. The manner in which it is used eliminates conditions that create premature wear.

But the outstanding contrast is in the fact that the centralized system refunds its total cost in lowered operating expense in all major plant operating categories—over and over again, as long as it is used—while individual contact methods continue to increase

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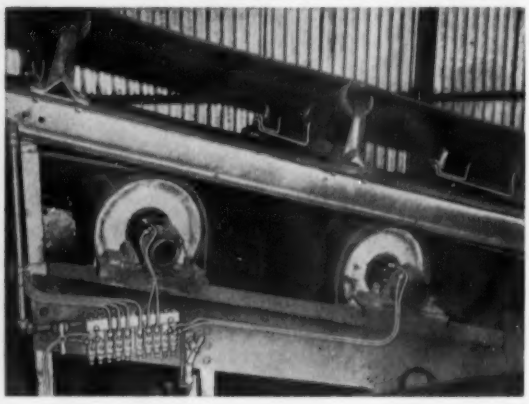

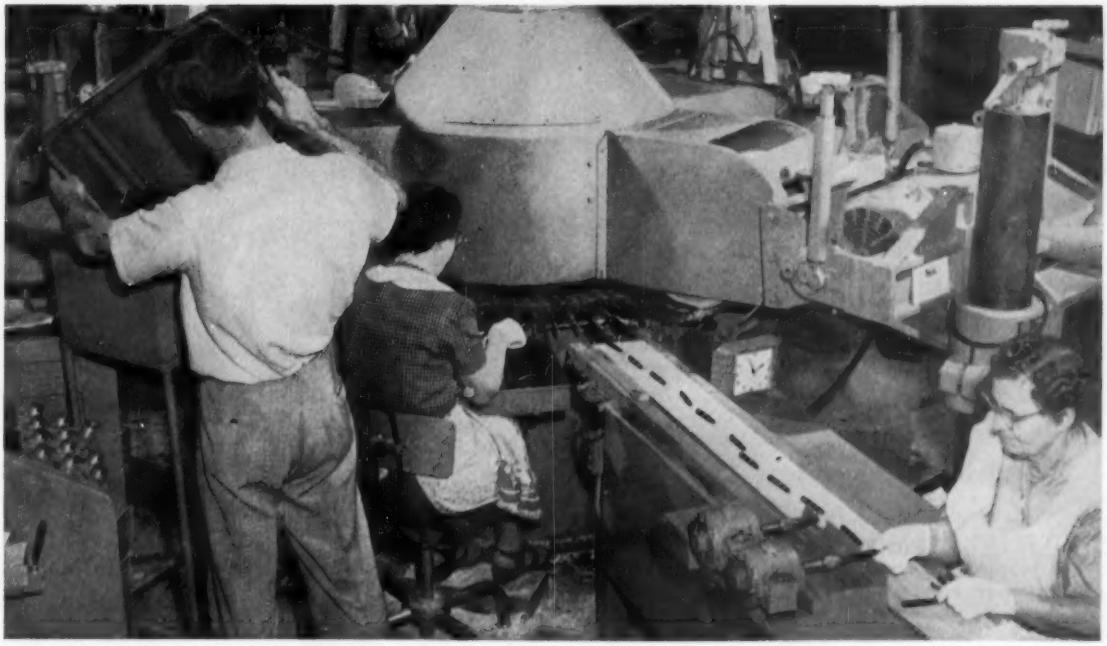

TYPICAL mechanization of handling around production machine. Parts to be pumiced are dumped into hopper, left, fed to horizontal arbors. After polishing, take-off devices removes parts, drops them on conveyor belt.

Plant Design for Small Parts Flow

By L. J. Bennett, Chief Process Engineer
The Parker Pen Company, Janesville, Wisconsin

HIGHLIGHTS of a new factory which was planned and built for maximum efficiency in material handling. Improvement can be fully realized when the new system is compared with movement required in one aspect of the old manufacturing method:

Previously, parts were molded in a small, outlying plant, trucked two miles to the main plant, moved up three flights to a process operation, upped another floor for more processing, then lowered four floors to be trucked back to the smaller plant for storage and shipment.

Today, practically all materials are moved laterally, under one roof, and the flow is continuous, without criss-crossing or back-tracking.

WHEN the Parker Pen Company began erection of its new Arrow Park plant in Janesville, Wis., major considerations were given to the entire material handling system that, eventually, was to be incorporated into the new factory. During the two years the plant was being built, and right up until its completion last year, careful planning of departmental and machine locations was determined on the basis of material flow.

After building plans for the plant had been finished and approved, the company obtained a ¼ inch-to-the-foot model. This toy-sized factory was not only exact in every detail but also equipped with similarly scaled models of all machinery that was planned for the plant.

The model was vital to the study of the general flow of materials. As well, it was used to study intra-departmental flow. Colored threads were used to show the travel of each piece from its first operation until completion; the method was used to establish, wherever possible, straight-line fabrication. This planning de-

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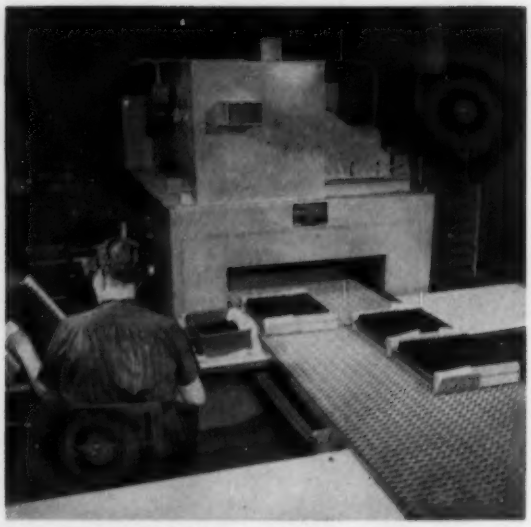


IN STRESS-RELIEVING, belt carries rack loads through oven. Parts arrive in tote boxes, are cleaned and assembled, and are then placed on special racks.

MAGAZINE-FED to assembly station, two parts of are loaded into hoppers by operator. Machine sizes, inserts, ratchets, stakes, stamps and unloads.

SMALL PARTS FLOW

Continued

termined methods of transportation and material handling that theoretically were the most economical or practical. Because of the many thousands of small parts, which could be moved easily between different work stations, the largest problem was handling at individual stations.

Heavy Stocks Handled By Hoist

Because only two departments—screw machines and molding—were scheduled to use heavy or bulky materials, these were located near the receiving dock. Bar stock, large containers of molding powder and molding dies regularly moved into these departments. Eliminating unnecessary travel of these items was considered to be essential to maximum material handling efficiency within the plant. Usually, only a small amount of these heavy materials would move into warehouse areas. They would be shipped, instead, directly to the department where they were processed.

One of the two stock handling hoists in this 212,500-square-foot plant is located near these departments and moves raw materials directly from the receiving docks to the machines that use them. The other hoist is in the plating department, where heavy containers of materials are moved from one bath to another.

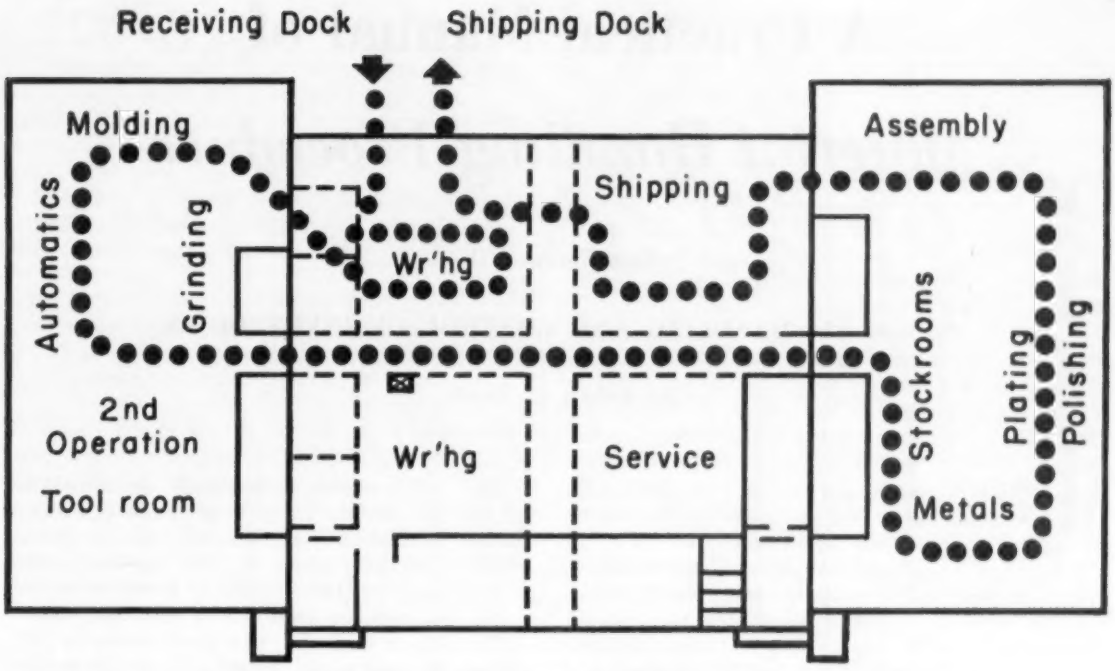
The hoist in the molding and screw machine department moves overhead along the entire width of the north wing of the plant. There are two sub-storage areas where materials used there are kept. Molding powders generally are carried on the hoist to an area on the south side of the wing and later lifted to the individual machines. Bar stock is carried to a rack where it is kept until trucked to machines.

Centralized Warehouse

During the plant planning sessions it was determined that the warehouse should be located in the center of the building, as close as possible to the receiving and inspection departments. The decision was made because all materials not moved directly into the production line are put on pallets and warehoused. Packing boxes, displays and general factory supplies are kept in the warehouse, and as different departments have need for them, they are moved out.

The general shape of the plant is rectangular, and, except for specialized operations on the second floor, all production is on a single level. Materials are received in the northeast section of the plant, move to the molding and screw machine operations in the north wing, and goes westward through a number of secondary operations. Then they move south through final machining, plating, polishing and sub-assembly, and east to the final assembly department.

From there, all finished parts move in a straight-line assembly operation, at the end of which final inspection and price tagging are performed. Finished pens then are moved to the shipping department, adjacent to the receiving department. Thus, materials have made a complete cycle of the plant to end only a few feet from where they entered it.



FLOW CHART clearly illustrates continuous flow through the plant.

Feeds and Belts Handle Parts

Because the most important material handling problem in this plant is not in movement between different departments, but in handling of many thousands of small parts at different stations, magazine or hopper feeds and conveyor belts are used wherever possible.

Among several notable magazine-fed devices is the cartridge and ratchet assembly machine used in the ball-point pen assembly department. Fully automatic except for loading, this is a six-station, dial indexing machine which sizes, inserts the ratchet, stakes, stamps and unloads.

Indexing of the machine is automatic; the various operations are performed by air cylinders controlled by cam-operated solenoid valves. Cartridges are fed pneumatically from the magazine, and a counting device records finished assemblies.

Ratchets are fed from a vibratory hopper down a track positioned to the ratchet inserting station. This machine is so controlled that if a part is not properly fed into it subsequent operations are not performed. Cycling is set at 2,000 units an hour.

Automatic handling has also been arranged around the dial polishing machine, which pumices, polishes and wipes over 2,000 pen barrels an hour. Barrels are loaded by hand on moving horizontal arbors arranged around the circumference of the machine. These parts then are pumiced, polished, wiped clean, and ejected onto a conveyor belt that supplies them to brushing operations. They are then moved to other stations where they are blown out, a vent hole in the barrel tip is drilled, and a packer picks them up.

Rearrangements Eased Through Access Area

Beneath the entire plant floor is an access area that has greatly facilitated machine location. All water, gas and electric service lines run through this area. Two-inch sleeves located on six-foot centers and capped by two inches of concrete provide "knock-outs" through which these service lines can be run. Thus, when it comes time to move any machine to any location in the plant, necessary utilities can be run to it through the floor.

Specially designed tote boxes and peg-type racks are used in many operations. Both handle small parts in lot sizes carrying from 400 to 5,000. Peg-type racks protect the finish of parts progressing through different fabricating operations. They are built of stainless steel rod so that chemical cleaning can be performed without removing parts from the racks.

Scheduled Deliveries

Handling between departments is by lift truck, which moves through the plant making pick-ups and deliveries according to a regular schedule. Because of the size of products, one load will move many thousands of parts. Intra-departmental movement is easily accomplished by hand.

When a part requires several cleanings during fabrication, the cleaning equipment is set up in the center of the series of operations concerned. Thus, handling is reduced to an absolute minimum, and there is no need to backtrack a particular part to get it from the production line, to a cleaning operation, and again into the production line.

A Practical Manual of

Material Handling Procedure

Installment 10

Section 11: HANDLING AND CONTROL OF INVENTORIES

By Robert C. Brady

MARKETING policy and type of manufacturing operation will largely determine requirements for finished and purchased parts stores.

A high production operation generally will produce items to be assembled immediately into a finished product. This type of production lends itself to a close coordination between manufacture and assembly as well as a better flow of materials, which—in, through and out—will require less storage space and can more easily be kept on a maximum-minimum inventory cycle.

A job shop operation is handled in either of two methods. In one, a company waits until it receives an order for its product and then proceeeds to manufacture and assemble. Or it may produce components for inventory and then start all orders at the assembly department. Of necessity, the second method requires more area and handling of parts, with a higher dollar volume in inventory.

In either type of production, the Sales Department forecasts the quantities, types and time of year the completed product will be needed to meet customer demand. Purchasing, Manufacturing, Production Scheduling and Inventory Control Departments must get together to determine from sales forecast the quantities of component parts for each size and type of product to be produced. They must also determine which parts will be purchased, manufactured or subcontracted.

The material handling engineer and stores manager should be informed of this company policy and be given a complete breakdown of component parts. It will be their responsibility to see that the stores operation is run on accessibility, accountability and availability of materials.

Stores Function Needs Close Control

Storeroom areas are frequently placed wherever there is no productive equipment. And in such places, it is easy for cubic space to be misused, handling left to hand labor and materials kept in general disorder. Here is an area where close control will contribute substantially to cast reduction.

Also, the storeroom is frequently considered the last stop for men who are no longer useful in the production department. Yet nowhere is there a greater need for intelligent personnel, who must be familiar with all parts, be able to follow an inventory control system and assume a great deal of individual responsibility. A poor clerk can cause many delays by: (1) delivery of wrong stock; (2) failure to find materials; (3) delivery of materials without orders; and (4) reporting inaccurately on records.

Purchasing, Engineering and Inspection all adhere to rigid specifications. Petty cash, stamps and office supplies are many times very closely controlled. But poor inventories, material pilferage, and handling damage losses are subject to blanket adjustments without too much question. They are costly to companies primarily because they are not segregated and do not show up on the cost sheet.

A storeroom operation should be planned in the same analytical manner as any other management function. Basic tools required are:

1. Full information on all items to be stored
2. A definite policy for inventory control
3. Adequate storage areas
4. Storage aids and handling equipment
5. A stores catalog or inventory record
6. Locator system

Full information on all items:

A work chart (see illustration) can be devised to gather all information about each item:

- a. Type of material—size, shape, weight and physical characteristics
- b. Container—kind, size, weight, quantity of parts
- c. Maximum-minimum inventory; frequency of issue; quantity per year, month, week, day; quantity per each receival; and quantity per issue.

If a space has been allocated, for example, for a part on a 30 day maximum and 15 day minimum supply basis, then that is all of such a part that can be adequately stored. Over-runs in the production area or excess purchases should be held to a very minimum. Many times the savings made on a purchase or

over-run will be spent in handling and storage cost; therefore nothing is gained.

If you are producing for an inventory period, let us say, a maximum of 500 parts, and they are to be reduced to the minimum of 200 pieces, how soon then can we expect new parts? What is the production cycle time? What quantity will be produced—300 or 500? If 500, then it is conceivable that space would be needed for 700 pieces, assuming that none of the 200 would be used during the manufacturing cycle time of the new parts.

For further discussion, if the inventory period is for seven weeks, how many times will the parts be produced? In a single lot of 500, two lots of 250 pieces each, or three lots of 166 pieces each?

Lot quantities have a direct bearing on the space allocated for materials. There could be a huge difference between providing space for 500 pieces or 166 pieces. Also, if at any time quantity needs change over a period of time, the stores operation should be notified to allow for either an increase or decrease of space required. For maximum efficiency, management must adhere to a definite production and inventory control policy.

Adequate storage areas:

To properly allocate available storage space, there are a few basic rules to consider.

- **a.** Endeavor to separate receiving and dispatching activities
- **b.** Determine most efficient layout of traffic aisles
- **c.** Use pillars, posts and walls to best advantage
- **d.** Stay within floor load capacities
- **e.** Determine types of storage to be used for various items
- **f.** Determine aisle widths to accommodate handling equipment
- **g.** Store slow moving items away from active areas
- **h.** Store fast-moving materials close to usage point.
- **i.** Provide for fire fighting equipment and the safety of all personnel, then determine storage capacity in both square and cubic feet.

Storage aids and handling equipment:

The parts, quantities, frequency of receival and issue are also used to help determine the type of storage unit. Parts, in many instances, can be put into size, weight and type groupings. By doing this, you are better able to determine the size of bins, tote pans, containers, pallets or other types of storage facilities needed.

Many plants have established standard containers which carry parts through various productive operations, become the storage unit, and are then issued as a unit to assembly. This helps eliminate much transfer time as well as possible damage to the parts. (See Section 6 on Containers).

On single, high production products some companies, such as those in the automotive industries, have practically eliminated the finished parts storeroom. Upon receipt, materials are taken directly to the assembly line area where space is provided for temporary storage. Larger items and manufactured parts are put on an overhead trolley conveyor for temporary storage and movement to a point of usage.

Inventory record and locator system:

The finished stores department has a definite responsibility for:

- **a.** Receipt of all materials into storage
- **b.** Location of all materials
- **c.** Record keeping of all materials in stores
- **d.** Checking of physical inventory
- **e.** Prevention of waste, spoilage, plus protection of all materials

(Continued on page 125)

PARTS ANALYSIS: PRODUCT TYPE WASLER DIVISION ASSEMBLY DATE 1-15-56

Part number	Name	Type of material	Size	Weight	Container	QUANTITY			Frequency of issue	Quantity per issue	Remarks
						Year	Month	Week			
10,561	L.H Guard	Steel Stamping	3IX45X.75	3.6#'s	Pallet	360,000	30,000	5,000	Daily	1,000	
10,566	R.H Guard	Steel Stamping	3IX45X.75	3.6#'s	Pallet	360,000	30,000	5,000	Daily	1,000	
98,318	Motor Rod	Steel Rod	12"X.25"	.5#	Box 125X125X9	1,440,000	120,000	20,000	Weekly	20,000	Boxes on a pallet
10,643	Dial	Plastic	3.5X2"	.125#	Box 24X30X15	360,000	30,000	5,000	Weekly	20,000	
11,311	Motor Frame	Casting	11X8.5X6	11#	Skid Box	360,000	30,000	5,000	3 Times a day	1,000	

EXAMPLE of a working control sheet. A company's type of production and merchandising policy will determine particular elements it requires in stores control data.

Questions and Answers on the System

Here are responses to some specific questions asked of Lockheed personnel:

1. *Are any other stores items besides parts issued on the self service basis?*

No, parts only. They include, though, both fabricated and purchased items. Thousands of miscellaneous small parts (called MSP and including standard items like rivets, nuts, bolts, turnbuckles, etc.) have, for a long time, been line stock items dispensed in rotating bins on the production lines.

2. *Are these parts bins outside the warehouse and near the assembly line?*

Yes, they are placed as near the actual using point, or points, as possible. In some cases, they are within arm's length of workers.

3. (a) *Are these parts charged out of stores inventory?*

The system includes both work-in-process and parts distributed from stores inventory. We do, however, retain a warehouse inventory.

(b) *What percent of these parts is retained in the warehouse?*

No fabricated parts are retained in the warehouse. Outside purchased parts and Government Furnished items are warehoused. In general, on these items we disburse to the line approximately one month's supply at a time.

4. *Are parts requirements known from a planned production schedule?*

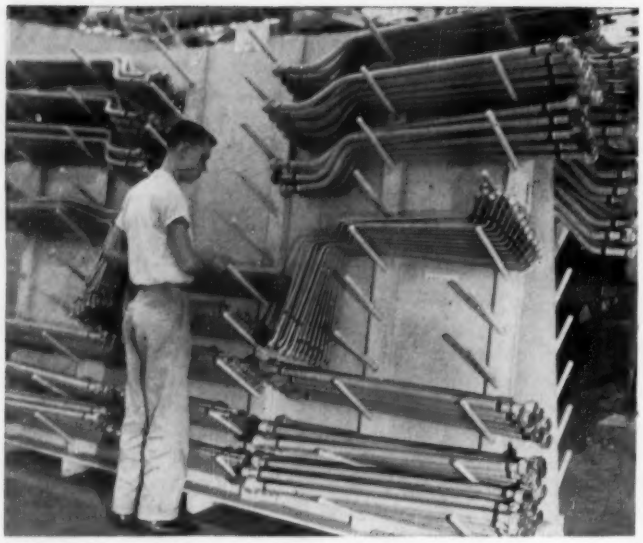
Yes.

5. *Is the floor space saved warehouse floor space? If not, how is this accomplished?*

It is "productive floor space". Our main factory operation is all under one roof, including warehouse space. Thus, when the central stock area for fabricated parts was eliminated, this freed approximately 67,000 square feet for productive use. Conservatively, we calculate a net gain in productive floor area of 60,000 square feet. The bins on the line were increased in number and required a small amount of additional space, thus offsetting the total area saved. Also, a small, central or clearing area was retained. We call it a "disbursing area"—actually, it is a regulating station.

6. *Do you recommend self-service for all stores items?*

No, certain high value items—Government furnished, classified items, and the like—are strictly controlled.



STOCK CONTROL (assembly) dispatcher services rack only a few feet from installation point on assembly line. Parts and assembly numbers are on racks.

Lockheed tests "supermarket" service

Decentralized

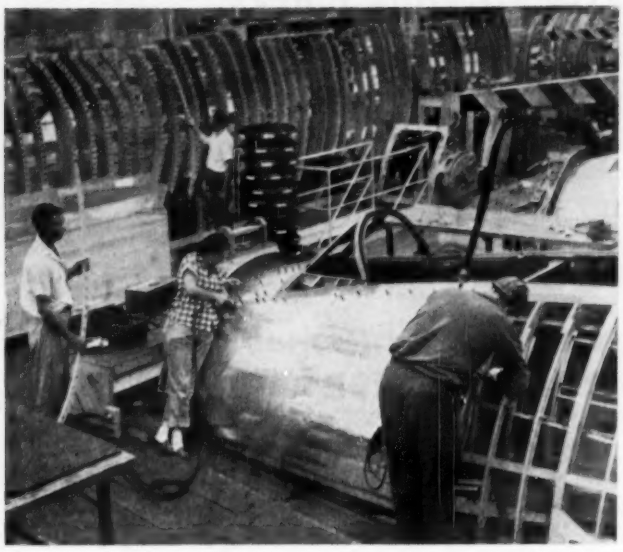
SUCCESSFUL use of a self-service stock bin system, known also as an "open line stock system," has been disclosed by the Marietta, Georgia, Division of Lockheed Aircraft Corporation—one of the world's largest, integrated aircraft factories under one roof.

The principle itself is not new, but its application on an extensive scale in a giant airframe manufacturing establishment is an innovation in the industry.

C. J. (Jack) Stanger, a department manager in the Production Control Division, had the idea of the open line system as far back as 1945. The notion grew from material handling problems encountered in wartime plane plants. He found one clue as to how it might work in early self-service grocery stores. The practical application, though, required years of planning and testing.

Production-Line Flow of Job-Lot Items

For a long time, the principle of line stock (decentralized parts distribution) has been used in the manufacture of job-lot, fixed-design items. But multiple problems have prevented its use in the production of such equipment as "custom-built" modern airplanes—like the B-47 Stratojet (a six-jet, Boeing-designed bomber) and the four-engine C-130A turbine-pro-



"PICK-AND-TAKE" stock operation shown as workers select parts for installation in B-47 fuselage section. These are ribs, which are stacked on top of jigs.

"SELF-SERVICE" bins and racks, around 1000 in total, issue some 25,000 different kinds of parts. "Cash register" of bins is the "shortage forecast".

for assembly line supply, and finds that, at minimum . . .

Parts Distribution Saves Five Ways

peller military transport (a Lockheed design), both of which are made in Marietta and which incorporate thousands of different kinds of parts.

Multitudes of parts, the various types of components, modifications of the airplanes during manufacture, schedule deviations, shortage control, the handling of inventory, engineering and planning changes, and other factors have previously presented barriers to decentralized parts distribution, except in a few instances.

One notable exception, of course, has been widespread use of rotating bins in production areas for distribution of "miscellaneous small parts" (MSP) where needed. These bins, which are open to production workers, have long been used for low-unit-cost items like rivets, nuts, bolts, and similar, very small (and standard) items used in quantity.

By late 1953, production control men at the huge Georgia factory felt they had enough of the answers to the problems to try a test run of the self-service stock bin plan. Stanger's B-47 Assembly and Stock Control Department set up the "supermarket system" in two assembly sections making the nose and tail of the B-47.

Enthusiastic cooperation of production workers—who are the vital link in making the system work—and immediate (and large) savings made possible in affected departments encouraged extension of the system to the entire assembly division.

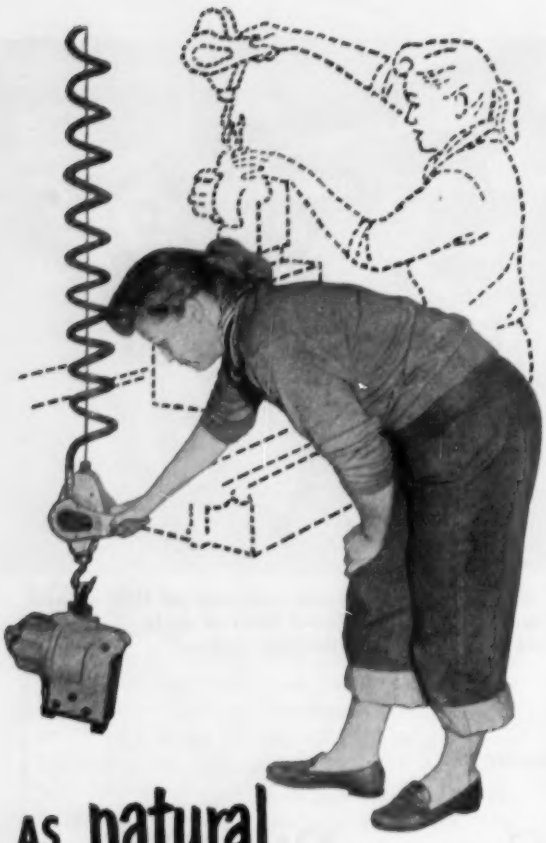
Here is the way some 25,000 different parts now flow directly from fabrication point to incorporation in the airplane:

1. On the basis of a shop order, the fabrication departments produce an order (or lot) of parts. On completion, parts are inspected and approved. This lot is loaded on a mobile platform truck (called a "mercury" or "float") and dispatched to the using production departments, or department. The Transportation Department has tugs (tractors) which usually pull trains of the floats to a central regulating (or disbursing) area.

2. It is when the floats, loaded with parts and identifying shop orders, reach the clearing or control area that Stanger's organization enters the picture.

3. In this area, a stock clerk checks the parts (numerically) against the order, but *does not usually find it necessary to remove the parts from the float.* A simple form is filled in—on the basis of the Master

(Continued on page 102)



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AMHS And SIPMHE Talk Merger

When the American Material Handling Society gathered in Cleveland recently for its semi-annual meeting, there was a discussion concerning the merger of the association with the Society of Industrial Packaging and Material Handling Engineers. No definite decision was made concerning such a merger, but John McReynolds, executive vice president of SIPMHE, said his objective was to bring about consolidation by January 1, 1956.

Fifty-four members of the board were in attendance. Presiding officer was National President Douglas A. Gillespie of Montreal. Reports were made on the success of regional-sponsored shows, and it was suggested that the National group sponsor the shows as a fund-raising project.

The Bibliography Committee reported that a complete compilation of material handling speakers, films and programs has been prepared by the Montreal Chapter and is ready for publication.

National Secretary J. Wellington Hall commented on the efforts of the group to establish a National Material Handling Week, and urged all members to write the Hon. Peter Rodino, Jr., M. C., for his speech before Congress on January 11, proposing that such a week be established under Presidential proclamation.

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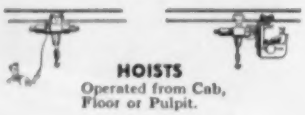

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DECENTRALIZED PARTS DISTRIBUTION . . .

(Continued from page 99)

Assembly Parts List (MAPL)—and this document is used in routing the parts to the point, or points, of use in B-47 assembly.

4. Then, a departmental dispatcher goes with this float to the correct using area, or areas. Here the parts are checked in on the Parts Inventory Control List (PICL) in the cost center, and the count is verified again—*without removal of the parts from the float.* Verifying the count is usually simple; it can be accomplished visually, in many cases, without a need to touch parts. Workers must take care, however, to make the counting accurate.

5. Finally, the parts are put, by the dispatcher, into the proper self-service bins or racks, which are labeled with Assembly Numbers and Parts Numbers.

6. These bins and racks are, in many instances, within arm's length of the workers using the parts. When a man gets ready for a part, it's there!

Flow Control on Daily Basis

The entire trip from fabrication to using point can often be expedited to a matter of minutes. In the normal flow, it takes several hours to a day. Flow is routinely controlled on a daily basis.

The principle involved is the familiar "direct-from-factory-to-consumer." Both "jobber" and "wholesaler" are eliminated.

Even in the super-charged production pace of World War II, stock control and material handling practices for aircraft items had the old-style, manufacturer-to-jobber-to-wholesaler-to-retailer-to-user approach. Fabrication shops sent parts to a storage area where they were checked in and stored. This was the "jobber."

From this storage area, parts were issued either in "wholesale lots"—enough parts for several aircraft assemblies—or were "retailed", a part at a time. In an attempt to speed up this system, there arose the practice of issuing at specified intervals enough parts for five ships.

(More on page 104)

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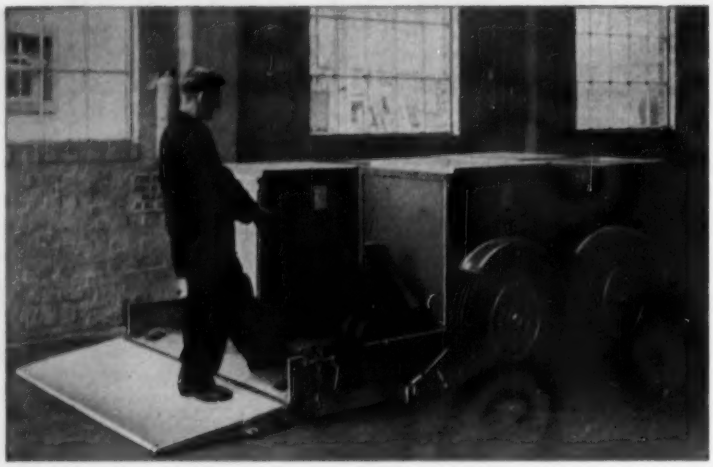

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DECENTRALIZED PARTS DISTRIBUTION

Continued

Even so, the conventional "five-ship" system required:

1. Large areas of floor space for storage.

2. Multiple handling of parts (plus frequent packaging and attendant storage problems).

3. Complicated paper work.

4. Detailed locator plans so that parts could be found quickly when needed.

5. A large number of personnel, as well as other costly, time-consuming and complicating elements inherent in a large material handling situation.

As airplanes have become more complex, with more than 100,000 different kinds of parts per ship, the complexity of the material handling system has increased. It has required personnel by the scores —even by the hundreds—and mountains of paper work to issue parts for, and control production of, today's complicated jet bombers.

The new "flow" system, whereby items go virtually directly and automatically to the production lines, has some now-obvious advantages. Experience to date at Lockheed-Marietta verifies and points up some of these:

Reduction of Costs: A major feature of the simplified material handling is reduction in personnel required for the department. A comparison of production control stock personnel needed under the two systems shows a direct reduction of approximately 25 per cent. Actually, since this reduction in personnel, production in the department has appreciably increased.

The cost of processing shop orders has been reduced by an average of approximately one-third—reflecting, primarily, time-savings and the reduction in personnel costs.

The system, because of the direct-flow aspect, reduces inplant transportation costs and requirements.

Reduction of Damage: The one-time handling of parts tends to reduce in-transit, or handling-type

MARVEL-SCHEBLER

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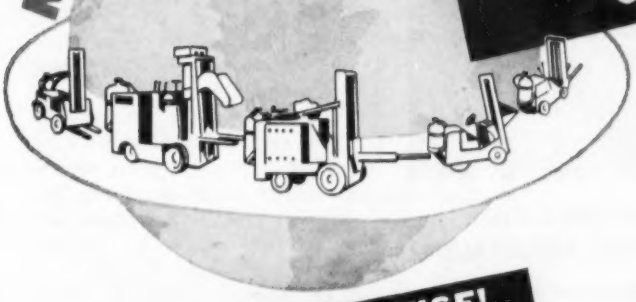

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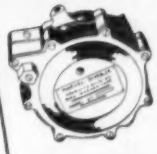

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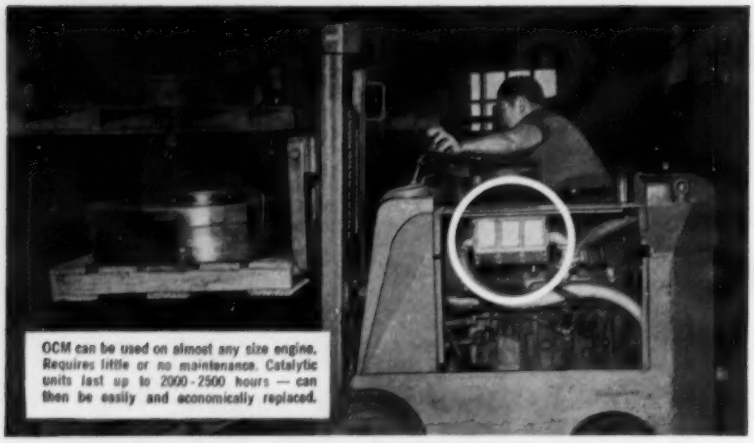

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DECENTRALIZED PARTS DISTRIBUTION

Continued

damage. Spot surveys indicate this to be a fact at the Georgia factory. Aircraft skins, for example, must be handled very carefully. Small scratches, dents and similar damage that might be considered superficial and minor in other industries are not acceptable in making today's high-speed planes.

The fewer times delicate electronic gadgets, precision parts and similar items are handled, the less the chance of damage. From this point of view, the one-time handling made feasible by the new system is a distinct advantage.

In practice, parts are rarely handled in transit; they are left on the floats. Since these floats are supervised by trained assembly dispatchers, chances of damage are minimized. Another factor which helps reduce damage is the placing of parts in the bins and racks along the production lines by these trained dispatchers. Quality control (inspection), the production departments, and production control all join in keeping a close check on the open stock bins for any mishandling, misplacement or misuse of parts.

Reduction in Floor Space: Another important saving brought by the system is in valuable floor space. By eliminating the central stock area, some 60,000 square feet of floor area has been made available for other (productive) uses. More than 500 bins used in the stock area have been declared surplus and released for other uses.

An unexpected space-saving result was discovered in effecting the change-over to the self-service bins. It was found that bins previously used for line storage of parts for five ships in many cases contained enough space—especially in the case of small parts—to accommodate the complete flow from fabrication.

Better Housekeeping—Officials report improvement in housekeeping practices in assembly areas. They attribute some of this to the bins and racks installed on the line. Heavy emphasis is put on keeping the huge plant as neat

FLOW

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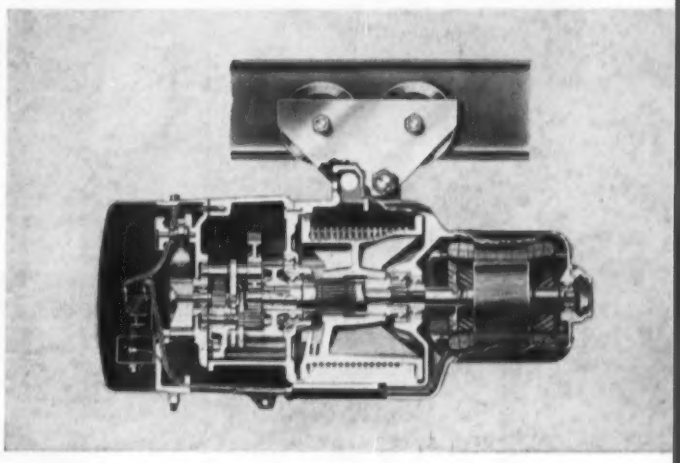
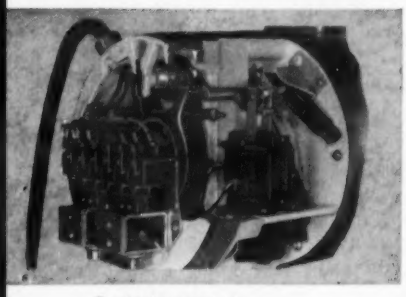
because of sound, generous and practical design of all components, plus standard NEMA specification totally enclosed motors. Heavy-duty design and fine balance give users definite assurance that 1954 Model WRIGHT *Speedway* Frame 1 Hoists will handle tough jobs on any duty cycle for which 1½ H.P., 30-minute NEMA motors are satisfactory. We guarantee this.

A New Booklet, #**DH-133B,** tells the full story of the many fully-tested structural, electrical and mechanical features that make WRIGHT Frame 1 *Speedways* ideal for production materials handling work. Write our York, Pa., office for your copy of this book that is pictured below.

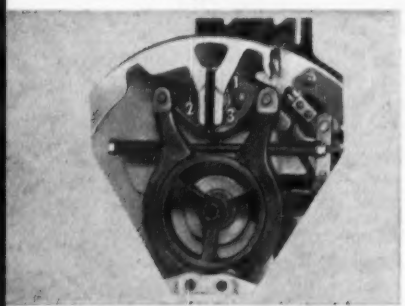


The ideal hoist for production work

It's the easiest hoist for Maintenance Men to service...



Easiest to get at



Nothing to adjust but the cam!

because those components that are most likely to need service or adjustment—on any hoist—are fully accessible when the end housing and side cover are removed as shown in the picture at the left. Removal of housing and cover is a simple matter of loosening or removing a few screws.

To compensate for brake lining wear on the motor brake on these 1954 Model WRIGHT *Speedways*, there is nothing to adjust but the cam. This adjustment is literally "as simple as ABC." Cam settings are pre-determined and numbered. There is no guess work. The long, calibrated compression springs and the solenoid are factory-set...they NEVER need adjustment for brake lining wear.

Write for this New Booklet

Write our York, Pa., office for this New Booklet, #DH 133B. It gives complete information on the 1954 Model WRIGHT *Speedway* Electric Hoists, Frame 1 and 1½ (500 to 4000 lb. capacities). The booklet fully describes the many electrical, mechanical and structural features that make these WRIGHT Hoists ideal for production and maintenance men.

ACCO

TRADE MARK

Wright Hoist Division
AMERICAN CHAIN & CABLE

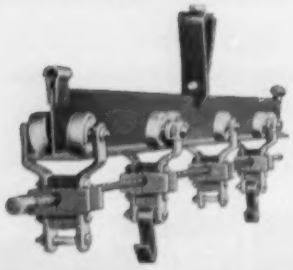
York, Pa., Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

Hoists
Trolleys
Cranes

Naturals
for materials handling should be engineered . . .

just as Mother Nature "engineered" the kangaroo . . .

and BUSCHMAN has pre-engineered conveyors to meet your every need



OVERHEAD CABLE CONVEYORS

ROLLER CONVEYORS

PORTABLE WHEEL CONVEYORS

PORTABLE POWERED BELT CONVEYORS

In conveyors there's a "natural" for every job . . . a type that is most efficient and economical for any given application.

The fact that Buschman designs and manufactures a *complete* line is your assurance of getting the one that will do *your* job best.

Portable wheel and roller . . . live roller . . . powered belt . . . apron . . . slat . . . overhead and table cable . . . as well as special conveyors are available from Buschman. Each type has been pre-engineered for minimum initial cost and to provide long, efficient service life.

Buschman materials handling specialists will assist in surveying your plant and will recommend the most economical and efficient conveyor for each operation. No obligation, of course.

Produce more . . . handle more . . . at lower cost . . . with an efficient conveyor system that meets your exact needs . . . a system "Better Built" by Buschman.

Write today for literature.

PRODUCE MORE . . . FOR LESS
Buschman Conveyors

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Representatives in Principal Cities

Complete Conveyor Systems For All Types of Industries • Engineered • Manufactured • Installed

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as a Dutch doorstep, and this pays off in safety, conservation, better production and otherwise.

A crucial problem in "opening" stock bins to production workers —in an industry where near-perfect quality is the only acceptable standard—is the possibility of some damage to parts prior to installation in the airplanes. A continuing study from several aspects is being made on this. One preliminary finding is that there is no detectable increase in parts damaged in assembly areas.

Control of Shortages: Weekly shortage forecasts are made out by the production control dispatchers, with clerical assistance where necessary. Key to this procedure —and day-by-day operation of the system—is the Parts Inventory Control List (PICL). Used in conjunction with line flow schedules, it provides a complete control of stock, shortage notices, and perpetual inventory in assembly departments.

Once personnel have mastered this form, printed on 8½ by 11-inch Kardex paper, it provides a complete method of operation for the self-service, flow system.

Dispatchers who are familiar with using departments make the shortage forecasts on "Request to Expedite" forms (RTE's). Standard Lockheed policy is to schedule the delivery of parts to the line 15 days before they are to be used. Thus, weekly cycles on this mean a span of 19 days, to cover through Friday of the week in which the forecast is made.

A complete technical description of the use of the PICL for varying purposes would be too lengthy for this narrative. Suffice it to state that, in conjunction with the Master Assembly Parts List (MAPL), the Continuous Production Schedule Index (CPSI), and other basic data, production controllers are able to take care of multiple-usage items, excess usage items, manufacturing changes, serialization problems, shortages and a variety of other situations.

The flow system, according to

THE NEWEST AND BEST IN SHELVING!

KLIP-BILT®

STEEL SHELVING

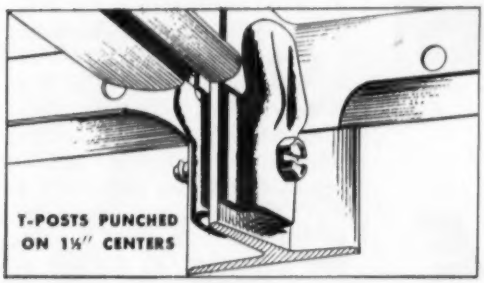
Pat. Pend.

installed fast without tools . . . combines high strength with low installation cost

KLIP-BILT, the revolutionary new boltless steel shelving, provides the fastest, simplest assembly of high strength storage equipment yet developed!

All fastening is with simple clips . . . easily installed by hand yet ingeniously designed to hold shelves, panels, dividers, and T-posts of various thicknesses pressure tight. Clips can be quickly disengaged, too, to permit easy rearrangement or disassembly of shelves.

Manufactured in standard sizes and parts.



SHELF CLIP

Just three parts for quick installation. Hardened cadmium-plated threaded stud and two heavy formed steel clips, one having stamped thread. Holds shelf flange tight against tough, rail steel T-post to prevent shelf from sagging when heavily loaded.

PANEL CLIP

Secures back panels to shelf flanges. Engaged at each shelf level. Quickly and conveniently installed from in front of shelving.

DIVIDER CLIP

Locks into two shelf holes to provide firm anchorage. Clips are flat, do not interfere with storage above or below shelf.

Label holders clip to shelf.

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A SHELF FOR EVERY LOAD

A. For average loads
B. For heavy loads
(Front and rear flanges reinforced.)
C. For extra heavy loads
(Type B with sides and center reinforced.)

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WELLSTON, OHIO

Branch Office: 250 S. Broad St., Philadelphia 2, Pa.

Specialists in Storage Planning and Manufacturing of Storage Equipment

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THE ONE-MAN-GANG
FORK LIFT TRUCKS
YOUR TOWMOTOR REPRESENTATIVE

New TOWMOTOR Roll Clamp upending multi-ton paper roll

FAST DEPENDABLE SERVICE

when you need it!

Every Towmotor fork lift truck is designed to stay on the job longer. However, abuse, or years of service eventually make repairs necessary. That is when Towmotor's easy service accessibility pays off. Each Towmotor Representative is a materials handling specialist who backs up the Towmotors he sells with the most efficient and complete service facilities in the field. Talk to him about the advantages of Towmotor 3-way Service. See your Towmotor Representative today, and write for complete service information. TOWMOTOR CORPORATION, DIV. 803 1226 E. 152nd St., Cleveland 10, Ohio.

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TOWMOTOR FORK LIFT TRUCKS AND TRACTORS SINCE 1919

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DECENTRALIZED PARTS DISTRIBUTION

Continued

Lockheed officials, tends to reduce line shortages and delays previously attributed to parts which were "in the pipeline" or in storage. To top it off, inspection time in rejecting parts is shortened.

Over $300,000 Saved

While it is not claimed that the system is either completely new or completely perfected, appraisals indicate direct savings of at least a quarter million dollars annually on personnel, plus the floor space saved and equipment and facilties freed for productive use.

Assignment of dollar values to savings is arbitrary and difficult to reconcile in all aspects, but the following values illustrate the scope of the savings: personnel, $250,000 per annum approximately; floor space, arbitrary annual valuation, $24,000; facilities (500 bins at replacement cost), $37,500.

This, of course, does not cover all phases of the savings nor does it consider increased productivity.

Summing up, a Lockheed official has said, in substance, "This is a modern method of material handling whereby the production workers and a simplified records and control system both carry a heavy responsibility for doing the job right. It works, and it saves very substantially in the cost of manufacturing a complex product —modern, multi-engine aircraft.

"In applying the flow system to a job-lot, custom-design product like the airplane, we have done some pioneering. There is every evidence that the flexibility and simplicity of the system will assure its permanent success and contribute significantly to reducing the cost of American air power."

AUTOMATION . . .

(*Continued from page 89*)

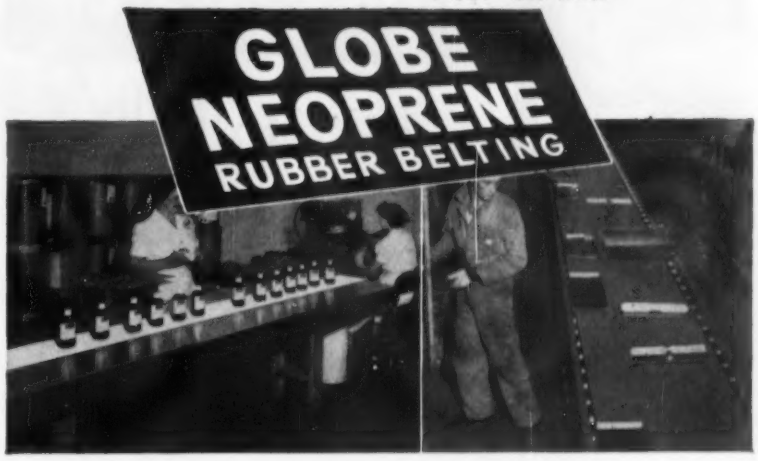
Figure 9 is a typical selector box on an overhead carrier. With this, an operator may predetermine the stations to which that carrier is to be sent. It is also possible, in this case, for these carriers to go out and look for work. The "EC" means empty carrier; with that setting the "empty" will go into the first track switch calling for empty carriers. Or, if the carrier has empty pans on it, it may be set to EP on the selector box, and it will be deposited in the first station or track switch where an operator requests empty pans.

In **Figure 10** we see a control panel for a power & free conveyor system in a recently installed bumper plating operation. This panel, which is approximately 27 inches long, presents a three-dimensional view of the system in which bumpers are automatically sent to the various operations—such as copper plate, nickel plate, chrome plate, repair, buffing, night storage, and shipping. Also shown is a close up of a part of this panel. When any section of this conveyor is not running, individual lights will immediately show just what has stopped—for example, if a certain power conveyor, plating machine, or conveyor lift is down, a proper light will indicate this condition.

Figure 11 shows a transfer (here for auto frames) from a floor conveyor to an overhead conveyor. A slat conveyor brings the part into proper loading position. Clamps are energized on the arms, which in turn are rotated to the upper vertical position. At the proper time the clamps are lowered about six inches, allowing the frame to rest on the overhead conveyor hooks. Clamps are then withdrawn, and, while the overhead moves continuously, the rotating mechanism also continues to repeat its cycle. In this case, limit switches are used to indicate that each motion was properly completed in order before the succeeding motion is permitted to start.

Figure 12 indicates the transfer of cylinder blocks from floor

built to combat OILS OR GREASES / ACIDS OR ALKALIS / FLAVORS OR ODORS / COLD OR HEAT / DUST OR DIRT



• Improved "thin-ply" belting with square edge, minimum stretch, positive traction, smooth surface and excellent flexibility, is taking the lead for conveying and power transmission. This belting is engineered by Globe for specific needs. Ideal for heavy industry or assembly plants, Globe's Black Neoprene Rubber Belt resists abrasion, oil, greases, acids or spillage that affect ordinary rubber belts. For the food handling industry, Globe's White Neoprene Rubber Belt and Hycar Rubber Belting resists organic and inorganic chemicals that have a marked effect upon natural rubber belts. For the textile, tobacco or other similar industries, Globe's Brown Neoprene Rubber Friction Surface Belt is valuable for many transmission operations. This belt is equally valuable for normal conveying operations where rubber covers are not required.

BLACK OR WHITE CONVEYOR BELTING —
for oily conditions or where combined heat and oil are encountered. High abrasion resistant 3/64" top cover, friction bottom.

WHITE OR BROWN BELTING —
friction surface top and bottom for transmission and conveying purposes.

WHITE OR BROWN RUFF TOP CONVEYOR BELTING —
for incline and decline conveyors.

WHITE HYCAR RUBBER BELTING —
for severe grease conditions, quick freeze temperatures, and above average heat conditions.

CLEATED BELTING —
with rectangular, crescent or U-shaped neoprene cleats vulcanized securely into the belt for conveying on severe inclines.

CUSTOM MADE BELTING —
cut to your exact width and length. All belting can be made endless at our plant or on the job by vulcanizing or cementing and air drying at room temperature.

WRITE FOR
"GLOBE NEOPRENE RUBBER BELTING CATALOG"

GLOBE WOVEN BELTING CO., INC.
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Cuts Paper Handling Time by 95%
PAID FOR ITSELF WITHIN 1 YEAR!

Swank, Inc., Attleboro, Mass., manufacturers of men's jewelry, leather and other accessories, have cut credit checking time of orders from 2 or 3 hours to 3 to 5 minutes. The credit supervisor reduced her daily trips to customer service and billing departments by over 80%. One full-time and one part-time messenger have been freed for more productive work.

A 3″ Lamson Airtube System accomplished this saving in time and manpower. Transparent shell carriers . . . with a 10″ inside length . . . give immediate recognition of contents. Engineered with simplicity, system consists of a central desk in customer service department with stations at the credit and billing departments.

Paper work is now handled more rapidly, more efficiently and at less cost. Discover how a simple Lamson Airtube System can save you time, manpower and money.

MAIL THIS COUPON TODAY.

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Please send me a free copy of "On Target" which will give me complete information on Lamson Airtube Systems.
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COMPANY .....
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Continued

conveyor to overhead power and free conveyor. The motors are clamped by arms, rotated 180 degrees, and later the engine is lifted vertically onto tong-type hooks supported by a carrier on the power & free line. The carrier is then ejected by a feeder onto the power line, which will take the loaded carrier away and bring a new empty carrier into the loading position.

Figure 13 is a sketch showing the automatic handling of automobile tie-bars in a sequence of operations.

FLOW thanks the American Society of Mechanical Engineers for its cooperation in preparing this article. Mr. Rumsey recently gave a talk on the subject before the Society's Detroit Chapter.

CONTROL CHARTS . . .

(*Continued from page* 81)

this state of control are satisfactory depends on the requirements of the process. In the tests reported, the individual weighings fell within a 3σ limit of approximately .25 percent. This is usually considered very satisfactory.

Should a point fall outside the limit lines of the $\overline{X}$ chart, it means a change tending to affect all weighings because it has been of a nature to alter the sub-group average. On the other hand, a point outside limits on the R chart denotes a change in the uniformity of the process.

Setting up Limits:

Once the initial data have been collected, the charts made, the process found to be in control and within specification tolerances, we are ready to prescribe the limits for future use. Since we do not know what the sub-group average range will be for the future weigh-

ings, the limit lines for the $\overline{X}$ and R charts must be based on σ', the expected standard deviation of the process, and the grand average of the initial study. The limits for averages will be $\overline{\overline{X}} \pm A\sigma'$. The central line on the chart for ranges will be $d_2\sigma'$, the lower control limit $D_1\sigma'$ and the upper control limit $D_2\sigma'$. The appropriate values of A, d_2, D_1 and D_2 are given in Table V.

How to Use the Charts

To find out if a process is remaining in control, subgroup weighings are taken at suitable intervals, such as each hour. Each sub-group must, of course, contain the same number of consecutive weighings as was used in each subgroup in setting up the control limits in the first place.

Data from Table II, taken a month after the initial study, fall within the limit lines in Figure 3 and show that a good state of control is still being maintained. The limit lines used for these $\overline{X}$ and R charts (Figure 3), are based on data from Table I and the weighings shown to be in a satisfactory state of control.

Data from Table III (light weights) was then plotted. Three points were found to be outside limits on the chart for averages. The general shift in average is apparent.

The graph for ranges, however, is still in good control. This indicates that the variation within the process is still acceptable but a shift has occurred in the whole *level* of the process.

Data from Table IV (resulting from purposely stopping the agitator in the feed stream) show averages in control, but ranges out of control. One point is almost on, and two points outside, the limit lines. In this case the process level is satisfactory, but the variation within the process unsatisfactory.

This also is proved by further analysis of the data in Table IV. One finds that the grand average, $\overline{\overline{X}}$ for the 24 weighings is a quarter ounce heavy, but the standard deviation, σ', is now 2.43 ounces or almost twice the value of σ' when the process was in a state of control.

Loading a freight car, top of Mobilift remains stable with 1 rear wheel raised. Power wheels maintain full traction on floor plates.

load "still on the level" with MOBILIFT® HYDRA-LIZER

You can pile 'em high and move 'em fast . . . in a smoothly carried load on a Mobilift with Hydra-lizer. Hydra-lizer replaces conventional pivoted axle with simple, positive hydraulic suspension which automatically compensates for variation in floor surface up to 3 inches. Absorbs all shock . . . protects load and truck from shock damage. Truck stays level. Power wheels get top traction. They're always on ground. Drivers do more with less fatigue.

Plus These Mobilift Features • • •

- Mobil-matic Transmission Assembly
- No Clutch Pedal
- Capacities From 3000 to 4000 lbs.
- Ball-Bearing Worm Nut-Type Steering
- 1-Piece Hood
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For complete details on this new line of Mobilift sit-down and stand-up fork lift trucks, MAIL THIS COUPON TODAY.

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Please send me complete information on ..... 3000 lb. capacity unit Model M-324, ... 4000 lb. capacity unit Model D-424, ... all Mobilift units to:
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in useful literature

These publications, written by experts, are available. Indicate your choice on the self-mailing Readers Service Card.

Chainless Conveyors:

Advantages of The Landahl Conveyor Company's trolley, track and drive unit are pointed out in a bulletin covering the firm's chainless conveyors. On-the-scene photographs give an eye-view of the equipment at work.

Circle 209 on Reader Service Card

Dragline Trucks:

Circular from Lewis-Shepard Products, Inc. describes the company's line of dragline floor trucks for both in-floor and overhead conveyor systems. Much pertinent data and descriptive details are included in the release.

Circle 210 on Reader Service Card

Solves Carpet Problems:

"How You Can Cut Carpet Handling Costs" is the title of an informative booklet issued by Easiquip Company. The book contains many useful case histories of how carpet handling problems have been solved by carpet mills, warehouses, wholesale distributors and retailers.

Circle 211 on Reader Service Card

Foot Touch Operation:

Nashua Corporation tells in a colorful folder how you can speed the operations of your shipping department through use of its foot operated electric tape dispenser.

Circle 212 on Reader Service Card

Warehouse Capacity Doubled:

A 16-page brochure has been released by The Frick-Gallagher Manufacturing Company titled "How to Double Your Warehouse Capacity". Purpose of the booklet is to show that while there can be no single fixed formula for greater warehouse economy, sizeable savings of space and time are nearly always possible.

Circle 213 on Reader Service Card

Methods Improvement Studies:

The first in a series of methods improvement studies analyzing actual installations to show how NesTier small parts handling equipment cut costs and increased production has been published by Chas. Wm. Doepke Manufacturing Company, Inc. A 20 percent savings in parts handling was realized by one company by conversion to the NesTier system.

Circle 214 on Reader Service Card

Stencil Ink Use:

D and A Company has issued a catalog sheet on its Quikspray stencil ink. The sheet illustrates some of the hundreds of uses of the ink and lists advantages of the product from a standpoint of efficiency, economy and dependability.

Circle 215 on Reader Service Card

Wirebound Pallet Boxes:

A 12-page folder on Generalift pallet boxes has been released by General Box Company. It describes and illustrates how wirebound pallet boxes are used in various industries.

Circle 216 on Reader Service Card

Pallet Truck's Performance:

Bulletin released by Barrett-Cravens Company features the electric pallet low-lift Powerox. The truck's dimensions and performance in aisles and up ramps is discussed.

Circle 217 on Reader Service Card

Opens Drums:

A fully illustrated two-color, four page bulletin describes the latest design of Merrill Brothers' drum opening tool. The folder contains complete specifications for use of the unit.

Circle 218 on Reader Service Card

Newest Movement Method:

A new concept of transportation is described by Clark Equipment Company in a colorful release on the Clark Mobilvan System. The new movement method is adaptable to city trucks, highway trucks and flat cars, and is said to result in big savings to shipper and consignee.

Circle 219 on Reader Service Card

Cargo Film:

How the Great Northern Railway reduces time and expense in handling cargo is shown in a film, "On Time", available from the Hyster Company. The film is of five minutes' duration, includes sound and is 16mm.

Circle 220 on Reader Service Card

Functional Racks:

Outstanding design features are highlighted by Lok-Rak Corp. of America in a brochure which describes the racks as the most functional and economical you can use.

Circle 221 on Reader Service Card

Simple Reel Handling:

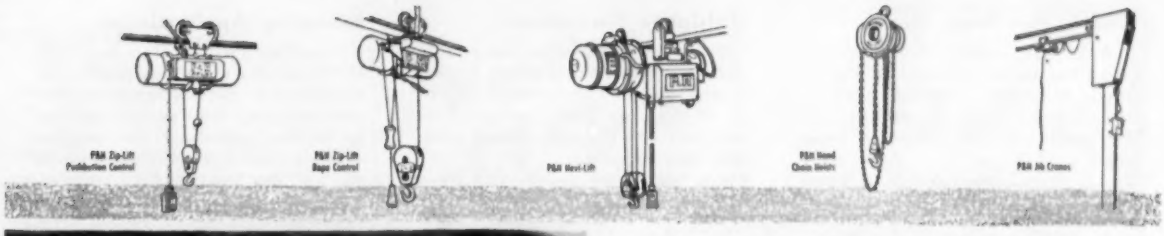
Brooks Equipment and Manufacturing Company has a pictorial release covering the Load Lugger especially designed for reel handling. Reels are simply and easily lifted from the ground to the truck bed, and locked for safe transporting.

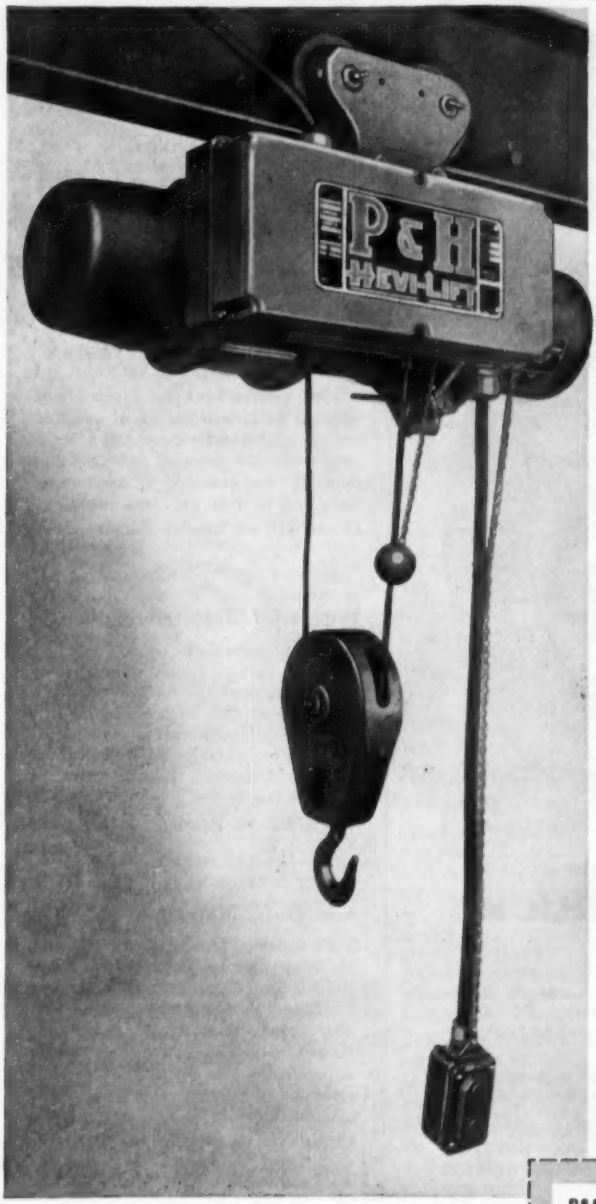
Circle 222 on Reader Service Card

Solves Weighing Problems:

"Heavy-Duty Weight- and Tension-Indicating Instruments" published by Martin-Decker Corporation pictures and describes the company's line of hydraulic weighing material handling equipment. Pertinent data is given on each unit pictured.

Circle 223 on Reader Service Card





The New P&H Hevi-Lift Special is a bear for work!

Work it harder and longer without damage — its heavy-duty motor loves it!

P&H engineers have really come up with a lulu in the new Hevi-Lift Special. It's a 500 to 4000 lb. hoist, with the usual P&H overload margin of 25% built in, in case you need it. And it's got a heavy duty, ½ hour-rated motor.

The new Hevi-Lift Special gives you the smooth operation of a *single-wrapped drum*. No jerks and jolts on the load — the wire rope rolls on-and-off smoothly. If a longer lift is needed, the length of the drum is extended, thus retaining the single-wrap feature.

Another plus value is its adaptability to low-headroom installations. The Hevi-Lift Special is cross-mounted — built for operation in close quarters.

All Hevi-Lift Special hoists are equipped with P&H pushbutton and heavy-duty controls. All of them are painted the new industrial green. All of them are manufactured with the painstaking care and attention to detail that has made the name of P&H a byword for economical "thru the air" materials handling.

Best of all, the new Hevi-Lift Special fits into the price range right where you'd expect it to. Send the coupon today for complete information on the new P&H Hevi-Lift Special.

Tear out coupon and mail today!

2895

P&H HOISTS
HARNISCHFEGER CORPORATION
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Gentlemen:

The new Hevi-Lift Special sounds like a hoist I could use. Send me complete information (illustrated) on it, please.

NAME .....

COMPANY ..... TITLE .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....

P&H HOISTS

HARNISCHFEGER CORPORATION

4643 West National Ave. • Milwaukee 46, Wisconsin

Circle No. 88 on Reader Service Card for more information

Truck Has Long Reach:

A 24-page catalog, illustrating and describing its complete line of electric trucks, is offered by Raymond Corporation. Featured is the Reach-Fork tiering truck with the "boarding house reach".

Circle 224 on Reader Service Card

Multiplies Usefulness:

How to expand the usefulness of a voice communications channel so that it is capable of transmitting from two to 18 times as much intelligence is described in a 12 page bulletin available from Motorola.

Circle 226 on Reader Service Card

Vibrating Applications:

Vibro-Plus Products, Inc. has available a bulletin which lists possible applications for vibratory equipment. Possible uses range from the food industry to foundry operations. The company would welcome an opportunity to supply you with new answers to old problems.

Circle 228 on Reader Service Card

Heavy Products Packaging:

Yours for the asking is a booklet published by Hinde and Dauch titled "How to Ship Heavy Products in Corrugated Boxes".

Circle 225 on Reader Service Card

Marks Floors:

Important bonus benefits are pointed out by H. C. Sweet Company in a single page release on the Florline upright marking machine.

Circle 227 on Reader Service Card

Inventory Control System:

How a large Colorado manufacturing company accomplished a 50 percent reduction of capital tied up in inventory, together with a 50 percent saving in clerical personnel, is described in a four-page illustrated bulletin released by Remington Rand Inc. An inventory control system was the key to the savings.

Circle 229 on Reader Service Card

Tape Facts:

The Pressure Sensitive Tape Council which is working at the job of standardization in nomenclature and test methods within the pressure sensitive tape industry, has available a brochure of facts and information about itself.

Circle 230 on Reader Service Card

Industrial Television:

Radio Corporation of America has issued a catalog which describes the camera pan and tilt mechanism developed for use with RCA industrial television. The equipment is said to be particularly suitable for applications where the camera's position must be changed frequently.

Circle 231 on Reader Service Card

For Bulk Materials:

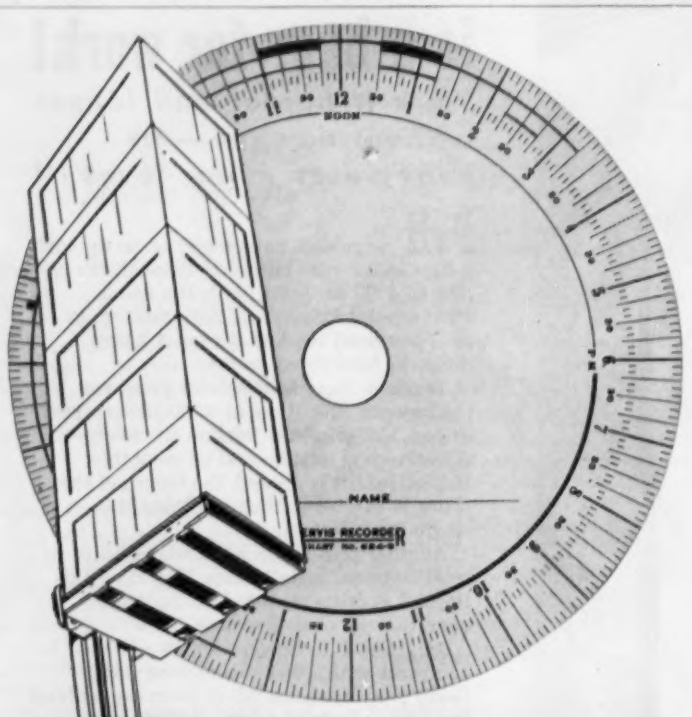
An improved type heavy duty Tellevel bin level control is described by Stephens-Adamson Mfg. Co. in an informative brochure. Practically any system of automatic controls or signals can be arranged by installing one or more of the units in any container in which bulk materials are stored, according to the manufacturer.

Circle 232 on Reader Service Card

Transit Crane Details:

A 12-page bulletin describing the Bucyrus-Erie Company 15 ton capacity transit crane is off the press. Illustrated by job application photos and closeups of mechanical features, the booklet includes a list of specifications and working ranges, plus a description of the unit's major advantages.

Circle 233 on Reader Service Card



OVERLOADING YOUR TRUCKS ISN'T THE ANSWER . . .

Equipped with Servis Recorders, your fork, high-lift, and platform trucks, conveyors, and other materials handling units, can be operated at peak efficiency—every working minute.

The Servis Recorder is an accurate instrument, easily installed, which records standing and moving time on a specially processed chart. Just bolt it on—no connection with any moving part. It will tell when your truck is BUSY . . . when it is IDLE . . . when it is LIFTING . . . when the engine is RUNNING. Also, when to OVERHAUL! For stationary equipment, Model M Electrical Servis Recorders chart productivity.

Write for information on Servis Recorders that help large manufacturing plants operate successfully. Ask for Bulletin I.T. The Service Recorder Co., 1375D, Euclid Avenue, Cleveland 15, Ohio.

Tells Every Move Your Truck Makes

The Servis Recorder

Circle No. 188 on Reader Service Card for more information

Overhead Cranes:

A complete presentation of the wide variety of handling jobs being performed by Whiting Corporation overhead cranes is offered in a booklet titled, "Presenting Whiting Engineered Cranes". Installation photographs show the cranes in action in many industries.

Circle 234 on Reader Service Card

Tape You Can Write On:

Labelon Tape Co., Inc. has available a four-color folder which describes a new pressure sensitive plastic tape you can write on. Pictures and descriptive material show many of the hundreds of uses of the labeling aid.

Circle 235 on Reader Service Card

Lower Production Costs:

Find out from John Morrell Manufacturing Company how you can ride the Morlift truck to lower production costs and reduced manpower needs. Free bulletin gives operating data.

Circle 236 on Reader Service Card

Chemically Active:

The new chemically active paper that blocks rust in one simple operation is described by Daubert Chemical Company in a recent bulletin. Facts are given about the Vapor-Wrapper, what it is and how it works to protect products.

Circle 237 on Reader Service Card

Designed For Logs:

A pictorial study of The Insley Manufacturing Corporation's Log Loader on-the-job is available to interested parties. General dimensions and operating data are contained in the bulletin.

Circle 238 on Reader Service Card

Enclosed Conductor Systems:

A 28-page illustrated catalog published by Insul-8-Corp. fully describes the company's enclosed conductor systems for the safety electrification of cranes and monorails.

Circle 239 on Reader Service Card

Conveyor Catalog:

Catalog published by Samuel Olson Manufacturing Co., Inc. describes and illustrates the company's line of portable stacking conveyors, horizontal belt conveyors, gravity roller conveyors and gravity wheel conveyors. Included is a wide range of types and sizes from which to choose.

Circle 240 on Reader Service Card

Attention: Lift Truck Owners! Users!

A low-cost Greer Accumulator makes the big difference!

New Hydraulic Component Takes the Bounce and Jounce Out of Lift Trucks... *FOR GOOD!*

Shock and vibration is common to all hydraulically operated lift trucks. When a lift truck with a heavy load moves or stops suddenly, runs up a ramp, or travels over uneven ground, the bounce and jounce set up by the moving load leaves nothing but the vehicle and driver to absorb the tremendous pounding. The solution to this hazard is the *Greer Accumulator.* Its gas-filled bag cushions shock and vibration to harmlessness. And the money-saving benefits gained far outweigh its low cost in...

Reduced Spillage and Breakage! Fragile glassware, crated eggs, bags of cement – anything can be handled more safely. Less danger of costly delays and customer claims for damaged goods.

Improved Performance! Lift trucks move faster up ramps, over rough flooring and ground. Loads stay put. No bounce or jounce to shift crates.

Less Operator Fatigue! Driver rides more comfortably with closer control of direction and load. Work flows smoothly without slowdowns.

Longer Lift Truck Life! Less downtime, less maintenance when vehicle is rid of damaging shock. Parts last longer, perform better, too.

Learn how a simple pipe-tee and hose connects Greer Accumulator to system easily, quickly, and at low cost. Call or write your dealer for brochure.

GET ALL THE FACTS TODAY!
SEE YOUR LIFT TRUCK DEALER!

Manufactured by Greer Hydraulics Inc. · Jamaica 30, New York

Circle No. 168 on Reader Service Card for more information

Plastic Closures:

A combination catalog and price list on stock and custom-molded plastic closures has been issued by the Plastics Division of Colt's Manufacturing Company. The folder enables the prospective purchaser to quickly and easily indicate a choice of material, color, liner and quantity.

Circle 241 on Reader Service Card

Adjustable Shelving:

Standard Pressed Steel Company has prepared a four-page colorful folder which points up in photographs, cartoons and text the outstanding features of its new Hallowell adjustable steel shelving. Photographs show a few of the more than 1000 possible combinations of the shelving.

Circle 242 on Reader Service Card

Re-Usable Containers:

An abundantly illustrated 16 page technical bulletin published by Peters-Dalton, Inc. describes the advantages of using scientifically constructed re-usable containers. The booklet features the lightness and compactness of the design.

Circle 243 on Reader Service Card

Vacuum Lift Speeds:

If you would like to eliminate slings and hooks from your lifting or moving operations with added safety to the operator and the product, you'll be interested in Ingersoll-Rand Company's release on the Vac-Lift.

Circle 244 on Reader Service Card

Easier Handling:

Phillips Corporation has compiled a comprehensive brochure describing its newest equipment, which is said to make material handling in the coal, steel and metalworking industries faster, cheaper and safer. The equipment ranges from heavy-duty trailers to collapsible storage containers.

Circle 245 on Reader Service Card

Round Steel Strapping:

For bundling, palletizing and carload bracing of pipe, lumber, steel and nonferrous metals, appliances, brick and automotive products, Gerrard Steel Strapping Division suggests you use its Model G round steel strapping machine. A colorful folder lists benefits and technical data.

Circle 246 on Reader Service Card

Cleaner Floors:

Floor machines, vacuums and heavy-duty blowers are described in a brochure published by the Premier Company. Titled "Two Minutes to Solve a Year-Round Problem", the release gives complete information on the company's heavy-duty, all-purpose and portable floor machines.

Circle 247 on Reader Service Card

Installing Fluid Couplings?

Complete installation and performance data on fluid couplings is contained in a booklet available from Twin Disc Clutch Company. Diagrams and drawings point out the ease with which the couplings may be applied on any type industrial equipment.

Circle 248 on Reader Service Card

Torque Converters:

An eight-page, four-color catalog describing Clark Equipment Company's line of Torcon torque converters is off the press. Extensively illustrated, the brochure depicts models and attachments for specific adaptations.

Circle 249 on Reader Service Card

. . . how AUTOETTE helped material handling at Douglas Aircraft

PROBLEM: To transport not-too-heavy material, mail, blue-prints, and personnel throughout a large plant economically, safely and with a minimum of fire hazard and fumes, since hauls were inside as well as out.

SOLUTION: A fleet of ¼-ton Autoettes. Douglas personnel used to walk 7 or 8 miles daily, now cover more ground, make more pickups, carry heavier loads at one-fifth cent per ton mile. Photographers like them too.

AUTOETTE
World's Lowest-Cost Transportation

Also available: ½-ton trucks, executive cars and custom-built Autoettes to meet the needs of specialized industry.

MAIL THIS COUPON FOR ILLUSTRATED FOLDERS
AUTOETTE SALES, Inc., Dept. 1135
730 West Esther • Long Beach 13, California
*Please send information on Autoettes for the following use:*_____
Send brochure on
☐ *Pickup Trucks* ☐ *Cruise About* ☐ *Golfmobile*
*FIRM*_____
*ADDRESS*_____
*CITY*_____ *STATE*_____
*BY*_____

Circle No. 141 on Reader Service Card for more information

About Door Openings:

The 1955 edition of the Barber-Colman Company Overdoor Guide on overhead type doors, electric operators and radio control is now available. Methods of preparing building openings and space required for the installation of an Overdoor are given in drawings and charts for all models.

Circle 250 on Reader Service Card

Lightweight Tote Box:

For small parts handling and storage Molded Fiberglass Tray Company recommends its fiberglass tote box, said to be lightweight, rust-proof and chemically resistant. A bulletin is available featuring the units.

Circle 251 on Reader Service Card

Nests and Stacks:

A one-piece molded tote pan that nests and stacks without mechanical gadgets is featured by G. B. Lewis Company in a colorful bulletin. The pans won't wedge—dry or oily—says the manufacturer.

Circle 252 on Reader Service Card

Steel Pallet Racks:

Republic Steel Corporation has available a brochure on its steel pallet racks. The racks are said to be suitable for stacking any bulky, uneven, odd lots, fragile or irregular materials.

Circle 253 on Reader Service Card

Bagging Scale:

A product data sheet on its improved bagging scale is offered by Richardson Scale Company. The sheet contains a detailed description of the scale, plus seven specifications and five features.

Circle 254 on Reader Service Card

Application Facts:

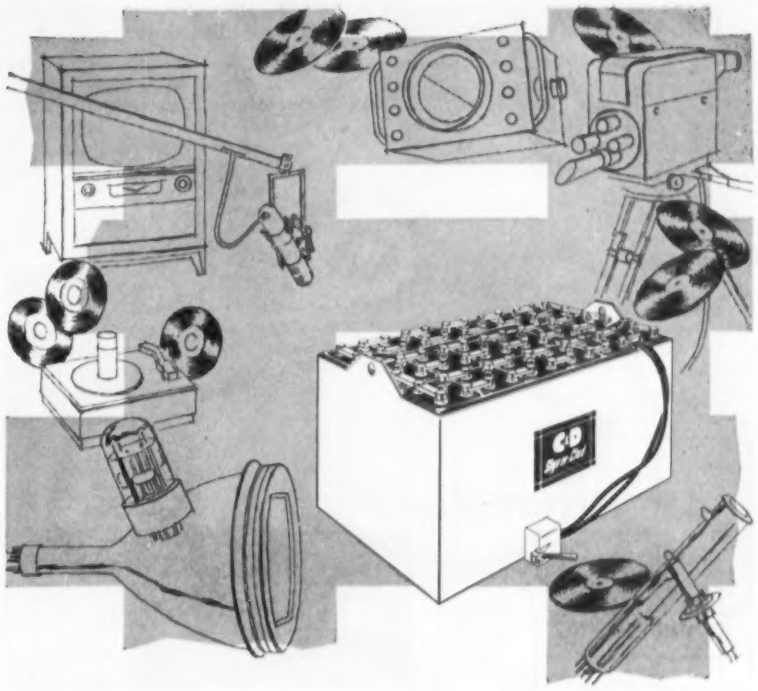
The Power Crane and Shovel Association has released a bulletin covering the application of power cranes in industrial plants. The bulletin covers the use of free moving cranes for outside warehousing and storage and is a pictorial study of typical applications.

Circle 255 on Reader Service Card

LP-Gas Couplings:

Inst-O-Matic couplings which are said to cut costs and be vital for safety on LP-Gas equipment are described in a folder published by E. B. Wiggins Oil Tool Co., Inc. Ease in connecting and disconnecting the couplings is featured.

Circle 256 on Reader Service Card



at RCA—C&D Industrial Batteries for EXTRA work

RCA, pioneer and leader in the development of the phonograph, radio and television, has brought pleasure and entertainment to countless millions all over the world. Naturally, RCA uses thousands of tons of materials of all kinds to make its famous products. To help solve its materials handling problems, RCA uses C&D Slyver-Clad* batteries as one of its major sources of power for its industrial trucks employed in daily operations. For RCA, like hundreds of other important companies, has found it pays to power with C&D Slyver-Clad batteries.

C&D Slyver-Clad batteries are approved as standard equipment by all electric truck manufacturers. For further information, write for Catalog.

*T. M. Reg.

C&D BATTERIES, INC.
of Conshohocken, Pa.

Manufacturers of Industrial Batteries since 1906
Sales and Service Offices in Principal Cities from Coast to Coast

Export Division: 1010 Schaff Building, Philadelphia 2, Pa.
Circle No. 69 on Reader Service Card for more information

Air Hoist Specifications:

The Aro Equipment Corporation has published a ten page brochure which lists specifications of various air hoists it manufactures. Much descriptive data is included.

Circle 257 on Reader Service Card

Reduces Costs:

A 24 page booklet off the press by Pittsburgh Steel Products Company tells how to reduce material handling costs. The answer lies in duty-designed Cargotainers, says the manufacturer.

Circle 258 on Reader Service Card

Conveyor Belting:

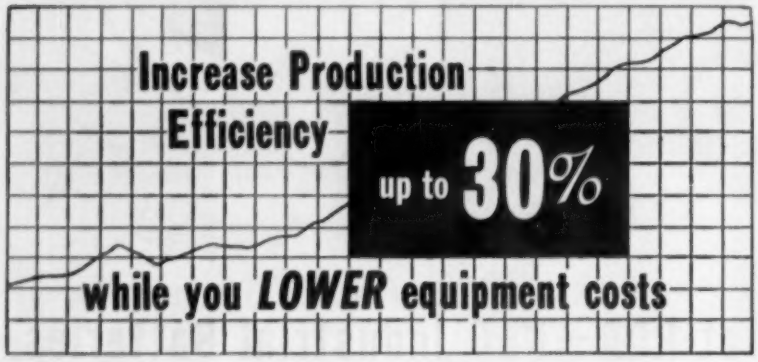
The complete line of solid woven, rubber and stitched canvas produced by the Main Belting Company is described in a new four page catalog. Detailed specifications are included.

Circle 259 on Reader Service Card

Vulcanized Containers:

Fibre Specialty Division of National Vulcanized Fibre Company would like to send you a pamphlet covering its line of trucks, trays, receptacles and boxes. Specifications are included in the folder.

Circle 260 on Reader Service Card



There is no need to pay a premium for high quality production equipment. Our new manufacturing techniques have brought about revised pricing policies which now make it possible for you to continue to stress high production standards . . . yet reduce equipment costs at the same time. We invite you to compare the quality, performance, and above all, the *price* of Rack Hydraulic Equipment. Write immediately for more information about our standard or custom-built models.

Turnabout
HYDRAULIC LIFT TRUCK
With Interchangeable Forks
2500 lb. capacity

$350.00 complete

HYDRAULIC UTILITY TABLES
1, 2, and 3 ton capacities
Priced from $295

SHEET FEEDING TABLES
1, 2, 3, 5, and 10 Ton Capacities
Hydraulic and Electric Hydraulic operation Priced from $390.

HD-22

RACK HYDRAULIC EQUIPMENT CORPORATION
CONNELLSVILLE, PENNSYLVANIA
Agents in Principal Cities, United States, Canada, Europe

Circle No. 107 on Reader Service Card for more information

No Storage Trouble:

Equipto Division of Aurora Equipment Company has printed a simplified booklet entitled "How To Solve Your Storage Problems". The release tells the reader how to set up his own facilities, make surveys, elevation drawings and floor plans.

Circle 261 on Reader Service Card

Controlled Reinforcement:

You are invited by Thilmany Pulp and Paper Company to see and test for yourself samples of its Wrap-Dri reinforced papers with controlled pattern reinforcement. A colorful bulletin includes facts as well as samples.

Circle 262 on Reader Service Card

Sling Chain Data:

A "how to do it" handbook on sling chains is available from Columbus McKinnon Chain Corporation. Everything from how to order sling chains to their care, use and inspection is presented in the well-illustrated easy-to-read format.

Circle 263 on Reader Service Card

News About Magnets:

A detailed compilation of many types of magnetic installations produced by Eriez Manufacturing Company is available in a 16-page catalog. The catalog contains technical data, specifications and information on installation of magnetic equipment.

Circle 264 on Reader Service Card

For Light Loads:

The Zephyr hand lift truck is pictured and described in a revised four-page bulletin published by The Yale and Towne Manufacturing Co. Light in weight, the truck was designed specifically for carrying loads up to 1000 pounds.

Circle 265 on Reader Service Card

Traveling Cranes:

In a departure from the usual type of catalog material, Harnischfeger Corporation has released an interesting bulletin on its Trav-Lift cranes. Numerous installation photographs are contained in the bulletin.

Circle 266 on Reader Service Card

Tractor History:

A 104-page, hardbound book published by Caterpillar Tractor Company titled "50 Years on Tracks" commemorates the company's 50th Anniversary.

Circle 267 on Reader Service Card

MEN IN THE NEWS . . .

(*Continued from page 36*)

. . . at Chain Belt Co.

Director and former president **William C. Frye** died recently at the age of 77. He joined the company in 1895. In addition to his affiliation with Chain Belt, he also served as a director of several other prominent midwest manufacturers.

. . . at Marietta Concrete Corp.

New chief engineer for the Design and Development and Engineering Division of the Baltimore branch is **Henning de Bang.** He was formerly associated with Ford, Bacon and Davis, Inc., consulting engineers of New York City.

. . . at Auto-Nailer Co.

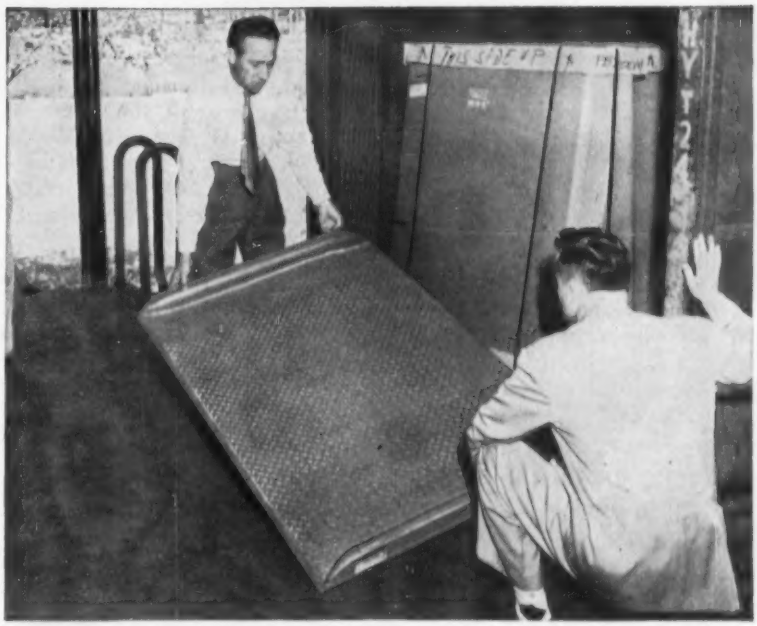
Promotion of **G. Mack Wynn** to the newly created position of executive vice president was announced by **William H. Wilkerson.** Wynn collaborated in the design of the original machine from which the Auto-Nailer was adapted, and when the company was founded in 1932 he became a charter stockholder and was elected to the board of directors where he has served continuously.

. . . at Appleton Electric Co.

Two new posts were created at a special meeting of the board of directors. **I. W. Strong** was named assistant to President **Arthur I. Appleton,** and **Wade H. Schroeder,** controller, became assistant treasurer.

. . . at Baldwin-Lima-Hamilton Corp.

Major changes among the company's top executive personnel were announced by Board Chairman **George A. Rentschler. McClure Kelley** has been promoted to executive vice president. He is a director of the company, and prior to his present appointment was



James Johnson, vice president of J. W. Johnson Co., positioning Magcoa Dockboard during talk with Magcoa representative

"Our Magcoa Dockboard speeds loading . . . pays for itself"

says James Johnson, Vice President, J. W. Johnson Co., canvas goods manufacturers, Bellwood, Ill.

"When we switched from heavy, makeshift steel plate to an engineered-for-us Dockboard, we chose Magcoa," says Mr. Johnson. "Our Magcoa Dockboard can be positioned quickly and easily by one man," he continues, "and when it's in position, *its safety angle holds it there.* Our powered equipment and operators handle loading and unloading in record time, and are then free for other handling jobs throughout the plant. We figure," says Mr. Johnson, "that our new Magcoa Dockboard will quickly pay for itself."

HERE'S THE SECRET behind the cost-cutting efficiency of J. W. Johnson Company's Magcoa Dockboard . . . and thousands of others like it across the country.

First, The Magcoa Representative personally checks all requirements: dock height, span, equipment underclearance, axle load, and many other factors that influence Magcoa Dockboard design and construction.

The next step is engineering—and Magcoa Engineers are materials handling experts. They utilize exclusive Magcoa design principles proved in thousands of successful installations . . . to make sure your Magcoa Dockboard will give the service expected, and more.

Then, Magcoa's mass-production plant takes over, where rugged angles and channel sections are welded to the bottom of Magcoa Dockboards . . . to give more than adequate structural strength and to lock the board securely between dock and carrier, regardless of the thrust of heavy, powerful lift trucks and pallet trucks.

Magcoa Dockboard in action under watchful eyes of Ray Gilbert, Buyer, Magcoa Representative and James Johnson.

YOUR MAGCOA REPRESENTATIVE FOLLOWS THROUGH when your Dockboard is delivered . . . to make sure that you know how to use it most effectively in speeding your loading and unloading, so that it can pay for itself in the shortest possible time.

MAGNESIUM COMPANY OF AMERICA

MATERIALS HANDLING DIVISION, EAST CHICAGO 1, INDIANA

DIVISION OFFICES: New York 20 • Philadelphia 18 • Washington 5, D.C. • Houston 17 • El Segundo (L.A.) Calif. • San Francisco 4

Representatives in principal cities

IT'S EASY to take Step Number One toward speeding your loading and unloading. Simply send for our amazingly frank Dockboard Facts File. It tells the Magcoa Dockboard story . . . and the story behind the story. Use the handy coupon.

For a free new Magcoa Dockboard Facts File . . . clip this coupon to your business letterhead, print your name and title clearly . . . and mail today to MAGNESIUM COMPANY OF AMERICA, MATERIALS HANDLING DIVISION, EAST CHICAGO 1, INDIANA.

Circle No. 25 on Reader Service Card for more information

Continued

general manager of the Construction Machinery Division and president of Austin-Western Company, a subsidiary. **Ralph K. Stiles** succeeds Kelley as president of Austin-Western, and **Henry F. Barnhard,** vice president of the Lima Division, succeeds him as general manager of the Construction Machinery Division. **Oliver DeG. Vanderbilt III** has been elected a director and vice president in charge of all commercial activities, President **Marvin W. Smith** has been named chairman of the executive committee, and **Henry F. Lockhart** has been promoted to director of sales of the Construction Machinery Division.

. . . at Rapids-Standard Co., Inc.

George R. Brockway, vice president in charge of sales and advertising, has left active management with the firm for increased activity as a marketing consultant, according to **James R. Sebastian,** president. He remains a vice president in the firm and will continue in an advisory capacity.

. . . at Hercules Motors Corp.

Attorney **John G. Ketterer** has been elected to fill a vacancy on the board of directors. He has served as general counsel for the company for some time. **Frank J. Malone,** a veteran of 20 years with the company, has been named general works manager.

. . . at Marion Power Shovel Co.

Election of **Milton T. Smith** as vice president and general manager was announced by **John P. Courtright,** president. Smith was named to a similar post with The Osgood Company, a subsidiary, and was elected a director of both companies. He was associated for 26 years with the Bucyrus-Erie Company, most recently as vice president in charge of purchases and inventory.

. . . at Hewitt-Robins Inc.

Austin Goodyear, vice president, announced the appointments of **Hamilton M. Ross** as manager of operations of the **Conveyors Division** and **Harold E. Murken** as manager of conveyor system sales. Another appointment was that of **Martin Vander Laan** as assistant to **Elmer C. Salzman,** manager of operations of the **Engineers Divisions.**

. . . at Yale & Towne Mfg. Co.

Several changes were made on the public relations staff. **Baird J. Simpson** has been appointed to handle press relations, and will headquarter in New York City. **Carleton P. Adams,** for the past two years publicity manager of the **Material Handling Division** at Phila-

NEW LABOR-SAVING *AUTOMATIC* DOCKBOARD HAS *5 OUTSTANDING ADVANTAGES*

HI-LO®
Automatic
DOCKBOARDS—

- **Eliminate dock attendant**
- **Eliminate electrical, hydraulic and related equipment**
- **Eliminate specialized, costly maintenance**
- **Provide unmatched safety**
- **Are low in original cost — practically eliminate operating costs**

The *truck* supplies the power!

Hi-Lo Dockboards operate on a new lever and counterweight principle. *The backing truck automatically lowers the ramp into position.* Unloading can begin *immediately* without costly man-handling of portable dockboards, or manual adjustments of handles, valves or buttons. Hi-Lo's exclusive Tilt Adjuster maintains smooth, jar-free lip contact with the truck bed as loads are transported in and out of the carrier.

When the truck leaves the dock, Hi-Lo automatically rises and is ready for the next operation. When in cross-traffic position, Hi-Lo Dockboards carry 100% of rated roll-over load. The board is supported by *two* wide-spaced beams, not just a single center piston. The Hi-Lo's safety features protect men, equipment and materials from costly accidents and help cut handling time by as much as 40%.

New Folder D-155 gives you detailed information — shows why Hi-Lo Dockboards cost *less* to buy, *less* to install, *less* to maintain,—yet give you *better,* more efficient performance than dockboards costing more than twice as much! Use Coupon today!

HI-LO®
Automatic
DOCKBOARDS
Manufactured by
KELLEY COMPANY, INC.
Formerly Dockboards Incorporated
316 E. SILVER SPRING DRIVE, MILWAUKEE 17, WIS.
DISTRIBUTOR INQUIRIES INVITED

KELLEY COMPANY, INC.
316 E. Silver Spring Dr., Milwaukee 17, Wis.

Gentlemen:
Rush Folder D-155 describing Hi-Lo Automatic Dockboards.

Company Name_____
Individual's Name & Title_____
Address_____
City_____ Zone____ State_____

Circle No. 121 on Reader Service Card for more information

delphia, is now West Coast representative of the company's public relations department, with headquarters in Los Angeles. **J. Henry Brown** succeeds Adams.

. . . at Chain Belt Company

William J. Sparling was appointed to the board of directors. He will continue in his present capacity as vice president and manager of the Milwaukee operations.

. . . at Thilmany Pulp & Paper Co.

New general sales manager is **Charles L. Dostal.** A member of the sales staff for the past nine years, for the past three years he has served as assistant sales manager.

. . . at Lyon Metal Products, Inc.

Otto M. Konrath and **Neal Ormond** were elected vice presidents by the board of directors. Konrath will have charge of all production, and Ormond will have charge of personnel relations.

. . . at Wayne Pump Co.

John S. Tunnell now has charge of product finishing. For ten years he was associated with DuPont's Electrochemical Division, and most recently the Catalytic Construction Company.

. . . at Jeffery Mfg. Co.

Four promotions of veteran employees in the factory management were made known by **Frank J. Durzo,** works manager. **Harold R. Warsmith** is general superintendent of all productive divisions; **Charles S. Thomas** is manager of the manufacturing engineering division; **J. J. Kubbs** is chief metallurgist; and **Archer B. Jones** is manager of the tool engineering department.

Now! A packaged conveyor!

• R-W "460" Conveyor carries plastic signs through painting and drying operations of Timely Products Mfg. Co., plant at Des Moines, Iowa.

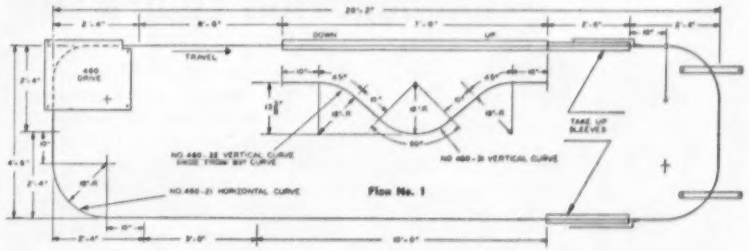
NEW R-W "460" Continuous Power Chain Conveyor requires no special installation engineering!

Richards-Wilcox' new "460" overhead conveyor can be installed without special engineering by your own plant personnel, quickly and easily, to meet *your* specific needs.

Completely packaged and shipped from stock, it offers economical and versatile light-load handling because of its lower load limits, flexibility, and easy installation.

R-W "460" is unequaled for jobs where the use of heavier conveyors is impractical. It is particularly recommended as a supplementary unit on production lines, and to help simplify and speed production where drying ovens, washers, paint sprayers, de-greasers and similar operations are involved.

R-W "460" is available up to 200-ft. maximum lengths *only*, with capacities of 8½ lbs. on 6-inch centers or 17 lbs. per lineal foot, and 200 lbs. draw-bar pull.



Flow No. 1

"460" Conveyors are shipped completely packaged, in convenient, easily-handled units, from stock throughout the U. S. Packages to fill any requirement up to 200-foot maximum length are immediately available from stock. For complete information and descriptive catalog, contact:

Diagram shows one of many different layouts possible with R-W "460" basic package. Up to maximum over-all length of 200 feet, variations are almost unlimited.

75 YEARS of QUALITY and SERVICE for RICHARDS-WILCOX AURORA, ILLINOIS

Richards-Wilcox Mfg. Co.
MATERIALS HANDLING DIVISION
Branches in Principal Cities

420 W. THIRD STREET, AURORA, ILL. SLIDING DOOR HANGERS & TRACK • FIRE DOORS & FIXTURES • GARAGE DOORS & EQUIPMENT • INDUSTRIAL CONVEYORS & CRANES • SCHOOL WARDROBES & PARTITIONS

Circle No. 172 on Reader Service Card for more information

ASSOCIATIONS . . .

(*Continued from page 53*)

• **Chairman** of the spring meeting of the Packaging Machinery Manufacturers Institute scheduled for Chicago, April 16-17, is John P. Corley, vice president of Miller Wrapping and Sealing Machine Company. An informal buffet and get-together will be held on April 16, and a busines meeting on April 17, plus the semi-annual reception and banquet that evening. The Palmer House is the headquarters hotel.

• **More than 60** leading Canadian and U. S. speakers took part in the second National Technical Institute of Packaging Association forum at the Royal York Hotel in Toronto on February 15. The one-day event was broken down into 11 forums. Program chairman was Paul J. Bernard, director, research and development, Hinde and Dauch Paper Company of Canada Ltd.

• **February 22 speaker** to the Wisconsin Chapter, Society of Industrial Packaging and Material Handling Engineers, was Earl Stivers of Package Research Laboratory. The program committee has scheduled John Mount of North American Insurance Company as the March 29 guest orator.

• **Electrical overhead cranes** will be the topic of a technical conference in Cleveland, March 28-29. Sponsored by the American Institute of Electrical Engineers, the program will include sessions on overhead traveling cranes, grab buckets and crane collector systems.

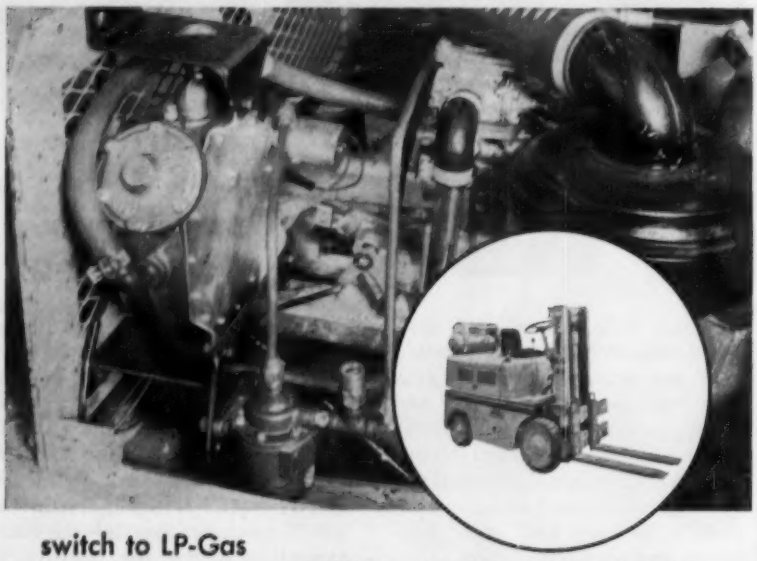
• **Election of John Drury Sheahan** to the board of directors, Association of Consulting Management Engineers, Inc., gives material handling engineers the first representation on the board since its formation.

Our Thanks to . . .

. . . the following companies for their valuable help in preparing last month's article, "Factors to Consider When Selecting a Hoist". (The usual credit block was inadvertently omitted . . . we apologize):

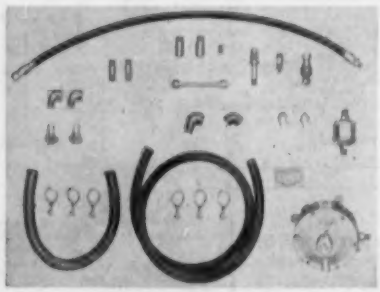
American Chain & Cable Co., Wright Hoist Div.; American Engineering Co.; Aro Equipment Co.; Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp.; Coffing Hoist Co.; Detroit Hoist & Machine Co.; Electro-Lift, Inc.; Harnischfeger Corp.; The Harrington Co.; Manning Maxwell & Moore, Inc.; Reading Crane & Hoist Corp.; Robbins & Myers, Inc.; Shepard Niles Hoist & Crane Corp.; Whiting Corp.; Yale & Towne Mfg. Co.

CUT MAINTENANCE COSTS IN HALF!



switch to LP-Gas
the Modern Fuel

WITH ALGAS LP-GAS CARBURETION EQUIPMENT



It is proven among fork-lift and industrial truck operators that maintenance costs can be cut 50% and more when operation is changed to LP-Gas, the modern fuel. Down-time is cut to a minimum and savings in fuel costs are substantial. Leading firms like Lockheed and Douglas Aircraft and many others have found that Algas carburetion equipment and LP-Gas is the perfect combination to bring huge savings. Conversion is simple and inexpensive.

Shown above is an ALGAS LP-Gas conversion kit. Conversion can be made by spudding into existing gasoline carburetor or replacing with an LP-Gas carburetor.

Write for our informative brochure on LP-Gas operation for fork-lift and industrial trucks.

AMERICAN LIQUID GAS CORPORATION
1109 Santa Fe Avenue • Los Angeles 21, California

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PRACTICAL MANUAL . . .

(*Continued from page 97*)

Today there are many systems developed for inventory and material control, most of them tailored to fit individual plant situations. Records keeping is most important, as inventories are often the largest single cost items in manufacturing, ranging from 20 to 90 percent of total investment. Without proper controls, materials are lost, damaged, not on hand when required, or stored in excessive amounts. All these factors lead to high cost, extra handling and greater storage needs. Keep record forms simple, yet adequate to cover all control points.

Cost factors:

Three important cost factors in storage operations must be analyzed if one is to minimize operating cost and obtain maximum efficiency:

1. Clerical cost—filling orders, planning and storage control, taking of inventory and all other clerical expenses chargeable to storing of materials.
2. Material handling cost—placing of material in storage, sorting, filling orders, delivery of materials, and equipment cost (purchase and maintenance).
3. Storage cost—rents and all fixed charges on building, plus permanent fixtures such as racks, bins, and shelving.

Any improvement in storage facilities will help reduce these costs. Some of the primary ways are:

- **a.** Make maximum use of space available.
- **b.** Store material for easy accessibility.
- **c.** Initiate procedures for ease of operation and control.
- **d.** Investment minimum in inflexible storage fixtures.
- **e.** Use flow charts to make a storage area layout, and thus minimize travel of men and equipment.
- **f.** Select equipment to reduce piece-by-piece handling, to stack and store for maximum space utilization, and to move material fast and safely. All

4 More Big Reasons

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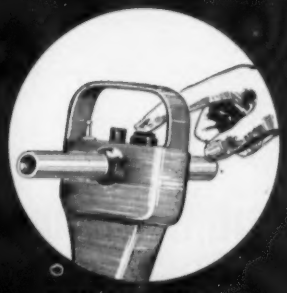
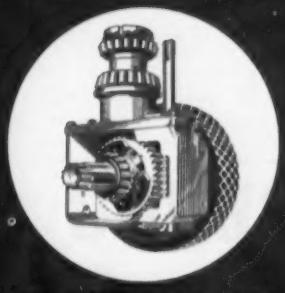


COMPLETE CONTROL
at your finger tips



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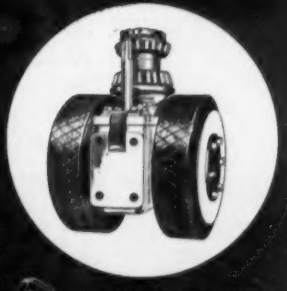
for long service life



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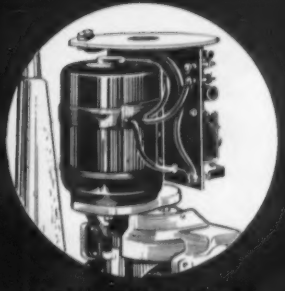
with differential for ease of steering and good stability



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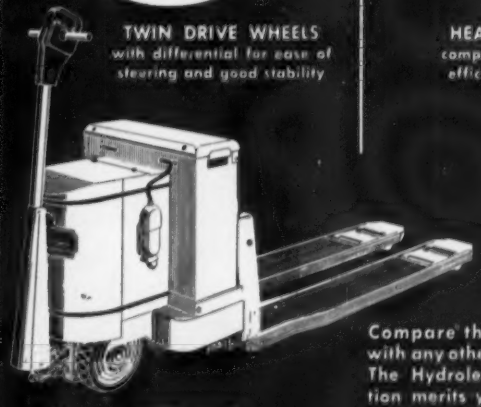

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LIFT TRUCKS INCORPORATED

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NOTE: The Dyna-Dual Power Unit is interchangeable on all models.

There is a model for every purpose to handle any kind of material.

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PRACTICAL MANUAL . . .

Continued

classes of equipment should be evaluated for possible use in the stores area.

Summarizing, these considerations mean that the more intensively the capacity of a storeroom or warehouse is used, the lower the unit cost for fixed storage expense. Significant savings can be made even in small operations if handling methods are efficient and if layout is designed for greatest ease in operation.

The April installment of the Practical Manual of Material Handling Procedure will consider "Factors Involved in the Selection of a Material Handling System". Managements interests and responsibilities will be discussed under three questions: (1) *What will be the fixed charges;* (2) *What will be variable charges; and* (3) *What effect will the new system have upon the firm's (or department's) break-even point?*

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For Every Loading and Unloading Need

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5. Beveled edges eliminate jars and jolts — protect loads and workers — save tires and equipment.
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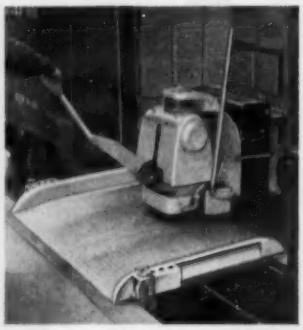

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Low-cost Penco Steel Car or Truck Loading Ramps: available Nationwide from shipping points in New Jersey or California.

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LEASING . . .

(*Continued from page* 71)

truck may be less than the cost of maintaining the old one, thus making it economically sound to lease a new truck. Even greater savings may be possible because a newer truck, besides being cheaper to maintain may prove more economical to operate.

Summary Of Advantages and Disadvantages

In conclusion, here are the basic factors for and against leasing:

Basic advantages are:

1. The lease permits use of equipment when working capital is short.
2. The lease frees working capital for other uses which may be more important or more profitable.
3. Return on freed capital often exceeds leasing interest charge.
4. Leasing permits fast tax write-off.
5. Leasing offers a hedge against inflation.
6. Leasing permits reinvestment of money from fast tax write-off in business.
7. Leasing permits tax write-off in big profit years.
8. The lease provides an operating budget control.
9. Leasing permits 100 percent financing.
10. Leased property appears only as a footnote on the balance sheet.

On the Other side of the picture, leasing disadvantages are:

1. A service charge is made for leasing.
2. Equipment does not become the property of the user when the lease is terminated although the user can rent it at a much reduced rate.

Of course, an option to purchase for one dollar is available; it permits the user to obtain title to the truck at the termination of the lease. If exercised, however, this option will prevent utilization of fast tax write-off.

Keep in mind that the service charge for leasing, plus the rental after the lease is terminated, can be offset by the savings which the

equipment produces, plus the benefits of faster tax write-off and better capital usage.

The small company with a shortage of working capital will find the advantages of better capital usage of prime importance. The larger company, with plenty of capital, may find the tax advantages of principal interest.

FOREST PRODUCTS . . .

(*Continued from page 77*)

been used to good advantage for transporting both logs and other types of wood products, especially in instances where it is necessary to transport such products over, under or around obstructions.

In the mill (a phase of the forest products industry which will be discussed in detail next month), conveyors are used extensively, from the time logs leave the pond or dry storage at one end of the mill until the lumber goes to the dry kilns or to storage at the other end. In many cases, logs are transferred from the pond to a relatively high log deck with a log haul-up chain.

This is a large bull chain, running upward along the bottom of an inclined trough. It is provided with dogs or lugs which carry the logs up onto the deck. After being cut to desired length on the deck, logs are kicked out of the log-haul trough, proceed downward by gravity to the sawmill carriage, are processed into cants or lumber at the head rig, and emerge onto a live roller conveyor at the back of the saw. In cases where a high log deck is not employed, logs are traversed toward the sawmill carriage on a series of conveyor chains.

FLOW thanks the following companies for their help in preparing the preceding: Allis-Chalmers Mfg. Company, American Tractor Corporation, Baker-Lull Corporation, Baldwin-Lima-Hamilton Corporation, Berger Engineering Company, Bucyrus-Erie Company, Caterpillar Tractor Company, Clark Equipment Company, Coles Cranes, Inc., Gerlinger Carrier Company, Harnischfeger Corporation, The Frank G. Hough Company, Hyster Company, Insley Mfg. Company, LeTourneau-Westinghouse Company, Link-Belt Company, Marion Power Shovel Company, Minneapolis-Moline Company, Pettibone Mulliken Corporation, Schield Bantam Company, Silent Hoist & Crane Company, Inc., Jervis B. Webb Company.

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Any rack easily accessible by one-man operated overhead crane with automatic double tong for quick pick-up and easy carrying.

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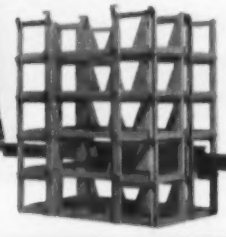
Tier and store steel shapes the simple, safe, space-saving way. No rack selection problem using overhead crane. Design-adapted for easy selection from racks without disturbing tiers. Custom-built for any capacity and stock length.



Item C-497

Sturdy, all-purpose bar racks in tiers save man-hours, make for maximum storage efficiency.

Thousands of different size bars may be stored in tiers to save valuable floor space.

Efficient use of floor space makes necessary rack tiers for various capacities and bar lengths.

Bars brought in racks direct to machines, ready for finishing operations.

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MAINTENANCE . . .

(*Continued from page 92*)

in cost, indefinitely. No other, single operating investment can effect so many vital overhead charges and, simultaneously, beneficially influence productive efficiency. Here are some of the advantages of the centralized system:

1. Prevents waste of lubricant.
2. Reduces man-hours devoted to lubricant application to minimum.
3. Eliminates machine downtime for lubrication and for repairs due to bearing failure or faulty operation of worn parts resulting from inadequate lubrication.
4. Improves quality of product; reducer rejects.
5. Eliminates product spoilage from dripping of excessive lubricant.
6. Increases productive rate and efficiency of machinery to a uniform maximum.
7. Reduces power requirements by eliminating friction—maintains power used consistent with work done.
8. Eliminates personal injuries and corresponding compensation costs attributable to lubricant application.

Full Benefits Take Time

Maximum advantage to be derived from centralized systems cannot be achieved, from an economic standpoint, by merely selecting and installing a system on one or a few machines. The ultimate purpose is centralized mass lubrication—that is, to blanket the total requirements of existing machine units and allow for future additions, much the same as the planning of an installation for power, gas or water. A detailed survey of machine lubrication requirements is necessary if one is to select the type of system, or systems, sufficiently flexible in application and uniform in design to meet all conditions. Where possible, machines should be grouped in banks or zones of 25 to 50 units and served by one, central, time-clock-controlled pump.

It is rarely possible to convert over to "centralized" in a manner to derive immediate, full benefit. The rate at which working schedules can be disrupted, and consequently, a change-over made, usually involves a prolonged period of time.

In one respect, this is an advantage since the change-over can then be undertaken as part of regular maintenance, and the expense that would otherwise perpetuate the old methods can be diverted to provide the new centralized systems.

Savings possible are shown through the following examples. A tire manufacturer equipped plant machinery with centralized mass lubrication at a cost of $35,000, and showed that down-time for hand lubrication would have equalled the output of more than $250,000 worth of production a year. A steel mill claims a clear saving of $104,904 annually on bearings alone, plus a 40 percent reduction in power consumption on tilting tables. A fire brick manufacturer who installed centralized lubrication on 26 presses, saved a

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COMPLETELY CO-ORDINATED CONVEYING SYSTEM

By combining several types of A-F Conveyors in this plant of a leading manufacturer of radios, A-F Engineers overcame the problems of moving various weights and sizes; and changes in production pace—with one completely co-ordinated system. Parts, chassis, cabinets and completed products are carried by A-F Conveyors through various departments for assembling and shipping.

The photo shows only a small portion of the extensive A-F System—at this stage an A-F Overhead Trolley Conveyor is carrying cartons and table model cabinets to a point where they will meet the chassis—also moving along at the correct predetermined pace on another A-F Conveyor line.

The efficiency of your plant, too, can be improved by modernizing your products-handling routine. A-F *Engineered* Conveying will reduce costs and pay for itself in a short time. Write, without obligation, today!

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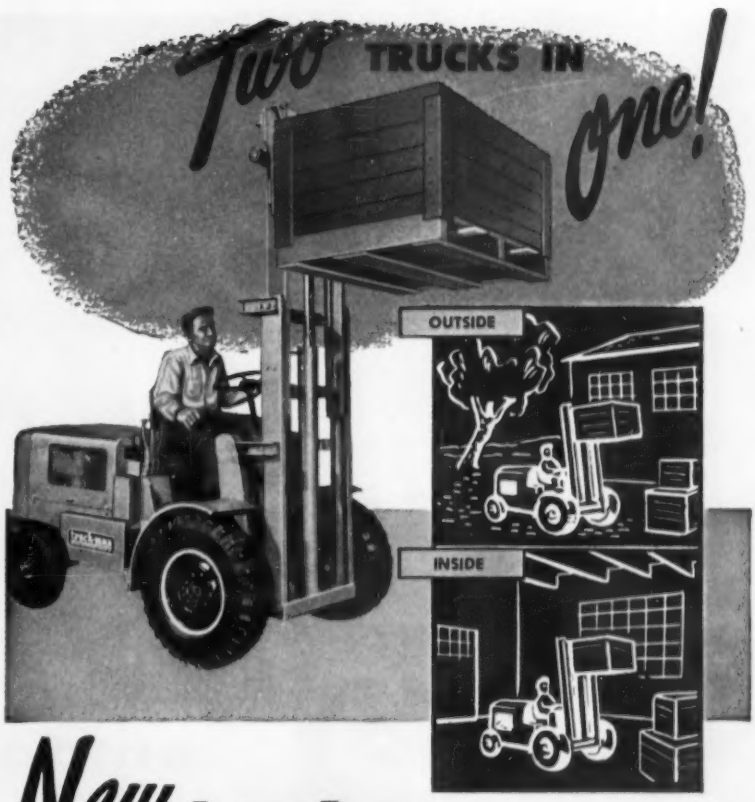
minimum of $45,500 annually on repairs. A textile mill equipped 86 machines with centralized systems and reports an average, annual saving of $1,726 per machine. A coal company saved $75,000 a year on their stripping shovels and $32,240 in labor cost, alone, in their Preparation Plant.

These case histories do not represent a few hand-picked, isolated instances. They are fully representative wherever application of lubricants has been controlled through the use of centralized systems.

"Automation" Includes Automatic Lubrication

We are constantly encountering evidence of progress in the trend towards "automation", as measured by the extent to which automatic controls supplant manual effort and human discretion. To design and install a series of machine units with the necessary controls to "automatize" a particular operation is one thing. To insure its continuous and efficient operation —free of needless machine downtime for lubrication or replacement of worn bearings and parts caused by inadequate lubrication —is another and most vital consideration.

Lubricant application, planned as a functional part of industrial lubrication, must provide for the automatic, precise and dependable *controls* essential to automation. These controls, when applied to lubrication—which is inherently part of the automation process—are incorporated in the modern, automatic centralized system.



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THAT'S RIGHT! —The Model 40 High Lift has the power, traction and footing to really do a job outdoors.

PLUS —The maneuverability (72″ turning radius), compact design and special features for top efficiency in material handling indoors; whether stacking in the warehouse, loading and unloading cars or trucks, or intra-plant service.

ECONOMICAL TO MAINTAIN FOR THREE BIG REASONS

1 **RUGGED**—The big Ford Engine, oversized clutch, heavy duty transmission and axles insure less maintenance.

2 **ACCESSIBLE**—The tilt cylinder is mounted above floor decking for easy adjustment or service. Engine, clutch, transmission or axles are removed in a jiffy for bench repairs.

3 **STANDARD FORD PARTS**—Serviceable at any Ford garage, include: hydraulic brakes, engine, differential, clutch, drive axle, and wear parts of steering axle.

Write or check coupon and mail today for catalog with complete details on the Model 40 and 8 other versatile Truck-Man trucks.

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PACKAGING AND SHIPPING SECTION

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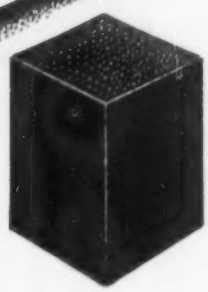

An Easy Index to This Month's Advertisers

Are you looking for a particular type of packaging and shipping equipment? Listed below are advertisers according to type of product they are advertising in this issue. We have attempted to make your job a little easier by listing them as often as possible. To use this index, find the type of product in which you are interested . . . turn to the advertisers listed under that product . . . circle the correct numbers on the reader service card, mail it, and you'll get complete information in a jiffy.

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When you think of lane marking...

Think of TAPE!

Lane marking colors you can *roll* on like magic . . . let your trucks wheel over right away! "Scotch" Brand Plastic Tape No. 471 revolutionizes lane marking—and no wonder! It sticks at a touch to any clean, dry surface, lasts up to 2 years, is unaffected by acids, greases, salts, and common commercial solvents. Gives an over-all saving of 30%. Eight easy-to-match colors let you put down "code" markings for every purpose. For complete information, just write on your letterhead to Dept. F-35.

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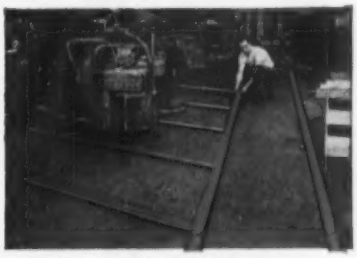
3M

LOOK what you can do with it!



MARK PARKING AREAS and travel aisles. "Scotch" Brand Plastic Tape No. 471 adheres to concrete, wood, painted or composition surfaces. Needs no special equipment to apply.

DEFINE STORAGE zones and traffic limits. A variety of colors can be used to identify different areas. Standard widths are 2 to 4 inches. Special widths available on request.

IDENTIFY FIRE STATIONS, emergency equipment locations. Mark danger areas, low clearance passages, and concealed obstacles. Symbols are easy to create (use as many colors as you need) and are ready for traffic immediately after tape is applied.

SET TRAFFIC PATTERNS to avoid fixed equipment; delimit work areas. "Scotch" Brand Plastic Tape No. 471 resists wear and abrasions, is long-lasting in even the heaviest traffic and manufacturing areas.

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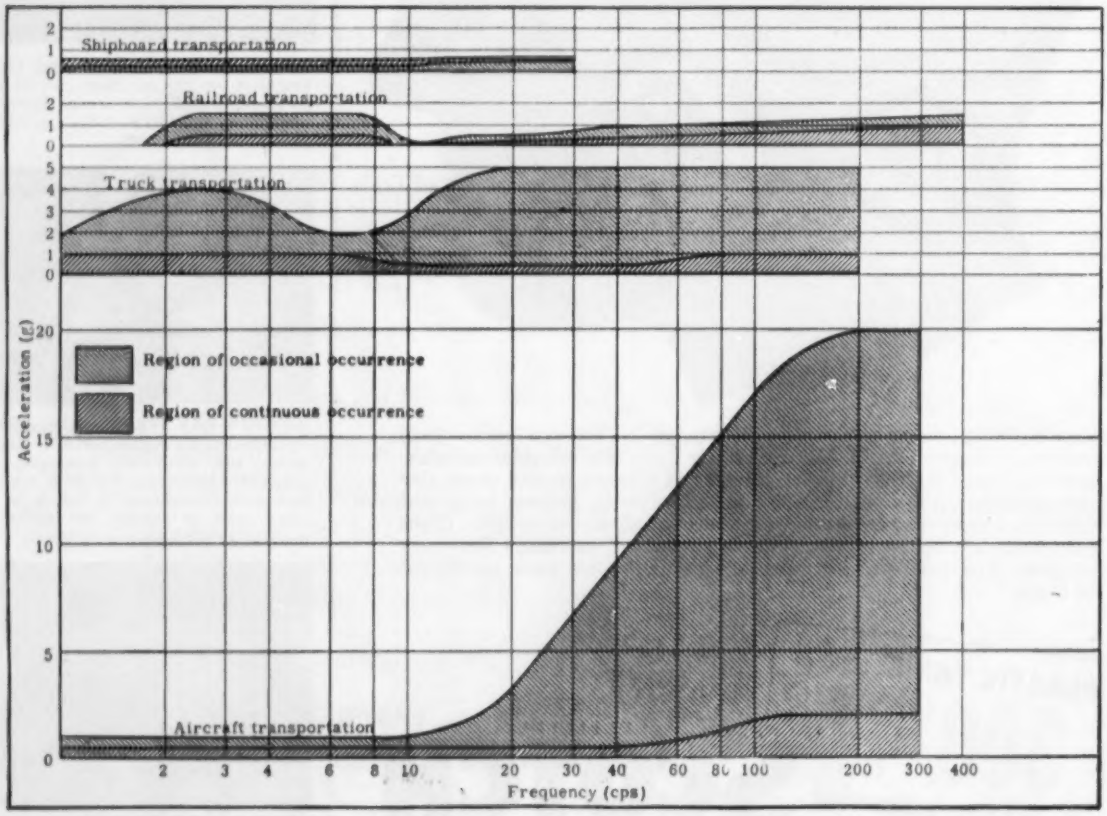
by L. E. LAMKIN
Sandia Corp.
Albuquerque, N.M.

Designing and Testing

Container Seals and Shock—

Sandia Corp., a firm engaged in classified programs involving ordnance applications of special weapons, embarked on an intensive package engineering program several years ago. Important highlights of data resulting from that program are revealed in this article. Much of the experience gained by Sandia engineers can be of value to other industries and Mr. Lamkin has graciously offered to provide help, to anyone requesting it, in applying his company's experience to other packaging problems.



COMPARISON OF ACCELERATIONS imposed by four different types of transportation. Note that lowest carrier input loads at 10 cps. For that reason, Sandia selects mounts with resonant frequencies close to 10 cps. Also, resonant frequencies of elements of each packaged item must be excluded from that range.

Mitigation Methods

UPON undertaking a packaging program at Sandia Corp., several years ago, we contacted many agencies in an effort to collect useful information from the available practical knowledge in the packaging field. We found much disagreement among railroad companies, railroad equipment manufacturers, government agencies and others regarding loadings resulting from railroad humpings and switching speeds. The disagreement undoubtedly resulted from use of different types of instruments. Because of this disagreement, Sandia started its own research program to determine the basis for design of equipment to satisfy packaging needs.

Several important questions . . .

. . . which should be answered before a packaging program can be undertaken successfully are:

"What are the handling operations to which the package will be subjected and the type of carriers to be used for transport of the package"? Also, it is necessary to know the amount of load the packaged item will withstand. The answer to these two questions will then determine the shock mitigation required.

Other very important questions that should be answered pertain to the environmental storage conditions involved, the frequency with which the container is to be opened and the frequency of surveillance checks. The answer to these questions will determine the type of seals required. This involves the amount of leakage to be allowed . . . the allowable leakage in turn determines the tolerances to which the container must be constructed.

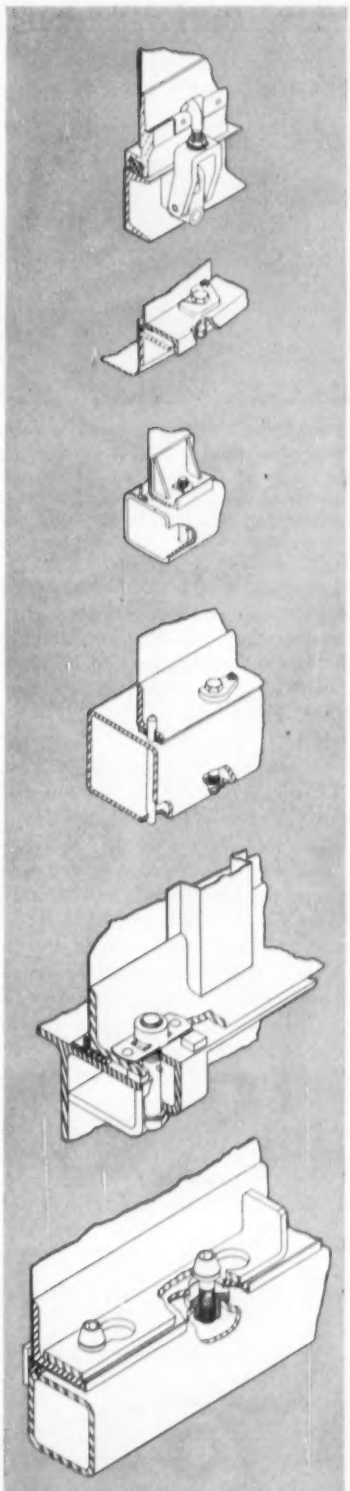
One of the most important considerations in container design is that of engineering the container and the contained unit together. In many instances where the two items are engineered together, the overall time scales can be reduced, the container weight and complexity can be minimized and extra cost avoided, all without compromizing the parent item. Fittings should be added to the contained object, eliminating the need for such things as special harnesses.

The design of container seals . . .

. . . is a subject to which we have devoted considerable study. Unless an engineer has spent some time in packaging work, it is difficult for him to realize the complications involved in designing an adequate container seal while still keeping the container within the desired weight and cost range, and having a closure that can be opened quickly and easily.

At Sandia, we design containers to an allowable leakage of two mm

(More on next page)



Typical Seal Configurations Developed By Sandia Engineers

Continued

SHEAR PAD, simply a block of rubber vulcanized between two steel plates, is used in one of two methods by which Sandia protects heavy items (weighing 1000 pounds or over) from shock. The other method uses coil springs and shock absorbers for in-transit protection.

of mercury in ½ hour at three psi gauge pressure. This leakage rate is based on desiccant changes every 18 months with six-month moniter checks. We determine the amount of desiccant to be placed within the container by the following specification: TM-38-230, NAVEXOS-P-938, AFM-71-1.

Here is a brief outline of the rubber specifications for a seal and the procurement method involved:

The first action is to procure a sample of 50 *durometer rubber in the configuration desired per specification MIL-R-*3065 *or ASTM-D*735-52*aT. The vendor should be requested to furnish a certificate of conformance to the specification and his number used to identify the rubber compounds and processing method. The most desirable rubber found for the particular application is then procured on the basis of the above specification and the vendor's number. The supplier's reputation must be relied on as to constituent and formulation of the rubber, since these are trade secrets. The disadvantages of the system outlined are:* (1) *It is time consuming, especially when several samples fail to pass specifications;* (2) *It is expensive to run acceptability tests on new rubber compounds each time a design is processed;* (3) *The selection of a supplier is controlled by the test samples only and may not be indicative of the suppliers production ability. These difficulties may be overcome by establishing company specifications using the applicable portion of MIL-R-*3065 *or ASTM-D*735-52*aT. As acceptable products are found through testing and suppliers' integrity established through experience, an "approved products list" can be accumulated and integrated with the specification.*

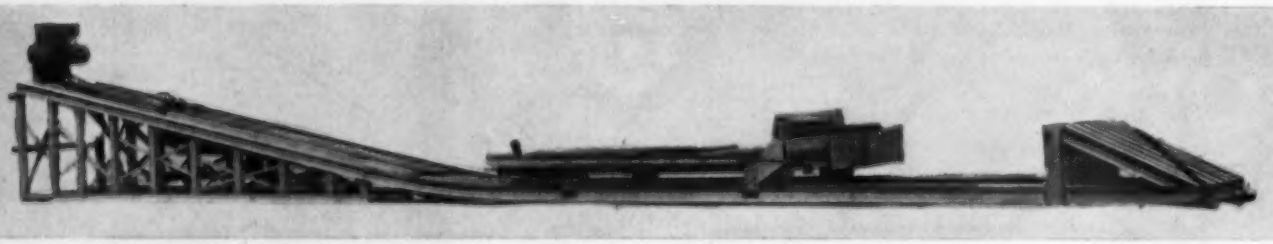
We have experienced a great deal of difficulty preventing gaskets from becoming unseated. The most desirable solution to this problem, in our opinion, is to hold the gasket in place mechanically. When this is not practical, cement must be relied on for retention. To determine the proper cement and application technique, a sample of the rubber compound to be used should be forwarded to a reliable adhesive manufacturer with a statement of the problem. Adhesive manufacturers perform advisory service free of charge.

It is of prime importance to allow sufficient room for a gasket to expand if the gasket is to be re-used. The expansion of the gasket should be limited to the desired amount by a metal-to-metal contact between the flanges of the seal. This will prevent the gasket from being subjected to excessive loads due to distortion of the container during shipment. We have found it to be bad practice to have two seals perpendicular to one another, as the tolerance involved in holding this type of seal cannot be maintained consistently in production.

Use of a pressurized dry-nitrogen

. . . was once felt to be necessary to give the required protection to contained items. This involved evacutating the entrained air in the container prior to nitrogenizing. A very strong and heavy container resulted.

To circumvent this difficulty, we considered purging the container with nitrogen, but excessive amounts of nitrogen would have been required. We then determined that a dry atmosphere, resulting from use of a desiccant and maintenance of a relative humidity (within the container) below 30 per cent, afforded the protection required for long-term storage. The primary



CONBUR TESTER, a 10-degree inclined ramp, was designed to simulate loadings involved in actual railroad operations. Loadings imposed by railroad were determined by tying several packages in a test car (connected to ballast car) and slamming it into three stationary brake-locked gondola cars loaded with sand. Minor failures of the test car were most often produced at impacts between 11 and 12 miles per hour.

TABLE A—SHIPMENT VIBRATION TESTS

Frequency cycling range (cps)	Cycling time (minutes)	Input acceleration (g-constant)	Input double amplitude (inches-constant)	Duration of test along each of three mutually perpendicular axes (minutes)
1-10-1	5	1.5	not to exceed six inches	45
10-60-10	10	—	0.060	45
*60-300-60	15	10.0	—	45

*Tests in the range of 60-300 cps are unnecessary if vibrations on the test article are attenuated to a value of one-tenth of the input vibration.)

reason for using a desiccant is to remove the moisture enclosed at the time a container is sealed. If a desiccant can be placed in a drawer, or similar device capable of being removed from the container without disturbing the main seal to allow desiccant replenishment, time can be saved during storage operations. Our storage records indicate that this system does not cause a significant loss of desiccant efficiency beyond that encountered when the desiccant is placed in small amounts throughout the container.

Recent laboratory and field test results have substantiated the theory that the amount of moisture retained by certain types of free breathing containers can be reduced to a safe level by means of a reasonable amount of desiccant for 18-month storage in the most adverse climatic conditions. Successful breathing arrangements used to date have involved the use of small holes in the container skin or the use of tubes. The small hole arrangement does not appear practical as it is susceptible to clogging, it allows the direct passage of water or foreign bodies into the container and many holes would be required to prevent a pressure differential from building up during rapid changes in ambient pressure (such as would be experienced in descending aircraft.)

Diameter of the tube used in the free breathing tube method has not been found to have an appreciable influence on results obtained. However, the efficiency of the system appears to increase as the ratio of tube length to diameter increases. For all practical purposes, a ratio of 10:1 is adequate. Most applications of this principle have been with ¼-inch I.D. tube.

The one disadvantage which we have found for this method is that is makes necessary the use of several times the amount of desiccant required in a sealed container.

If, for some reason, it is not desirable to remove a container plug during air transport to equalize the differential pressure involved and the container is not strong enough to withstand the differential pressure, it is then necessary to equip the container with a set of valves which will perform the task automatically. We design our containers to withstand either a positive or negative pressure of approximately four pounds per square inch, which is sufficient for the pressures generated by changes in atmospheric conditions. We equip the containers with either removable plugs or relief valves designed to open or close at approximately three pounds psi. Each container must also be equipped with two additional plugs that can be removed for pressurizing and gauging to permit checking the container's seal.

If it is necessary to have a package remain in the sun for extended periods, and the container item is restricted as to allowable temperature, we have found that the most practical way to mitigate the higher temperature is to suspend a canvas or other type of cover over the package in such a manner as to allow free ventilation. This practice eliminates the need for inclusion of insulating material in the package design.

The ideal shock mitigation system . . .

. . . is one having mounts with resonant frequencies other than those imposed by the carrier. However, as the entire practical frequency range will be impressed in use, it is necessary to follow some other criterion. We select mounts with resonant frequencies close to 10 cps as this has been found to be the frequency at which the lowest carrier input loads exist. It is imperative, therefore, that resonant frequencies of elements of the packaged item be excluded from this range. In many cases, the true condition can be determined only through testing. We have found, that in general, commercially available shock mounts are adequate for use in packaging the lighter equipment. For items of approximately 1000 pounds or over, however, we have used two systems: one is that of using coil springs and shock absorbers; the other makes use of a device known as a shear pad (simply a block of rubber vulcanized between two steel plates.) Existing drop and rollover tests that have been published by several governmental agencies are not used as the criteria for the design of our heavier containers.

Packages containing light equipment are likely to experience greater loads during handling . . .

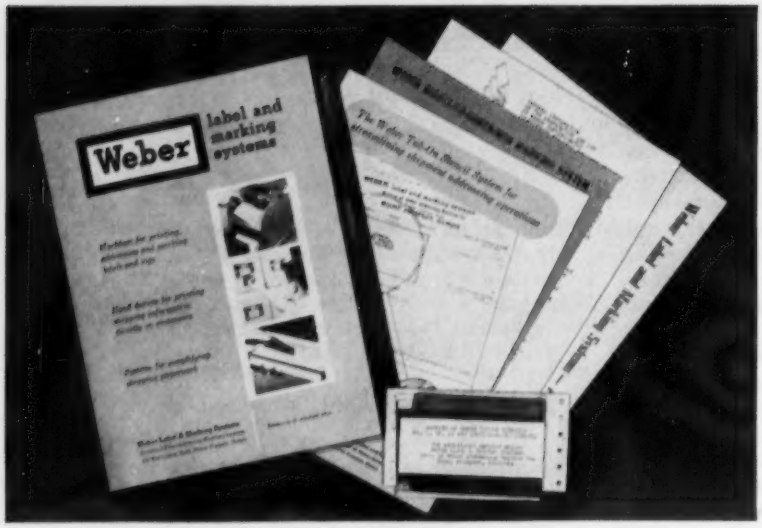
. . . than those containing heavy equipment. Packages of a weight that can be man-handled may be pushed off a truck, or otherwise mis-handled. The result is usually an abusive free fall.

Heavier packages require the use of hoists, lift trucks, etc. for handling and are therefore not subject to the same abuse factor as lighter containers. During the past five years we have had very few instances where our heavy packages have been dropped. When

(More on next page)

This "free" file-folder kit will show you

How to modernize your shipping operations



NOTHING LIKE IT EVER BEFORE! Not a catalog of products, but a file folder of systems created to streamline shipment addressing and marking, and simplify shipping paperwork.

Cost-conscious firms have discovered that the key to efficient shipping and packaging operation is a fast, low-cost system for addressing and marking containers. That's exactly what this File-Folder Kit is about.

Described and illustrated are systems that make shipment addressing and product identification marking faster, cheaper and more accurate. You'll see how addressing operations can be tied-in with the preparation of shipping paperwork, and how the entire chain of events leading to the addressing and marking of your shipments can be streamlined. And there are also product samples that you can try out!

Never before has so much factual information been offered on this important subject—and it's all yours without charge or obligation. Make sure you get your Weber Label and Marking Systems File-Folder Kit right away! Simply fill out the coupon below and mail—today!

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☐ Please send me a Label and Marking Systems File-Folder Kit.

☐ Also, we would like to talk to your representative as soon as possible about improving our shipment addressing and marking operations, and simplifying our paperwork.

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Individual_____ Title_____

Address_____

City_____ Zone____ State_____

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such instances have occured, the package has been subjected to much higher loadings than the existing governmental specifications would require. We have found that, in general, to design to governmental specifications would result in packages of prohibitive weight without producing packages capable of withstanding the loadings imposed in the few instances where heavy units have been dropped.

Defect rates on the various containers designed at Sandia Corp. indicate that the designs, although less heavy and rugged than comparable containers designed by others, are adequate for their intended applications. Damage to containers caused by shipping and handling hazards rarely result in damaged contents. Most major container damage is caused by careless handling.

Container testing has been vitally important to our packaging program . . .

. . . to permit us to design containers and handling methods which provide maximum protection.

We have made many tests to determine if our package will successfully mitigate the shock loadings imposed by the various types of carriers. We have found that railroad shipment imposes the greatest shock loadings encountered. The use of actual railroad equipment for conducting tests is time consuming and expensive. To eliminate the need for such tests on each package, we have constructed a 10-degree conbur ramp designed to simulate the loadings involved in actual railroad tests. Loadings imposed by railroads were determined by tying several packages in a test car connected to a ballast car and slamming it into three stationary brake-locked gondola cars loaded with sand.

It was determined that minor failures of the test car were produced at impacts between 11 and 12 miles per hour. During these

(Continued on page 146)

cut sealing time by two/thirds!

Use the successful, modern way to seal . . . with 2 strips instead of 6. It's Center Seam Sealing — made possible by Sisalkraft Sealing Tape's precisely laid, 2-way, reenforcing. Available through your paper merchant, or write for samples of Sisalkraft Sealing Tape. American Sisalkraft Corporation, Attleboro, Mass.

SISALKRAFT

Sealing Tape

Glass-Reenforced

Accepted for Parcel Post, R.R., air express, truck shipments, and carload, LCL under Rule 5 Section 1C of Uniform Classification.

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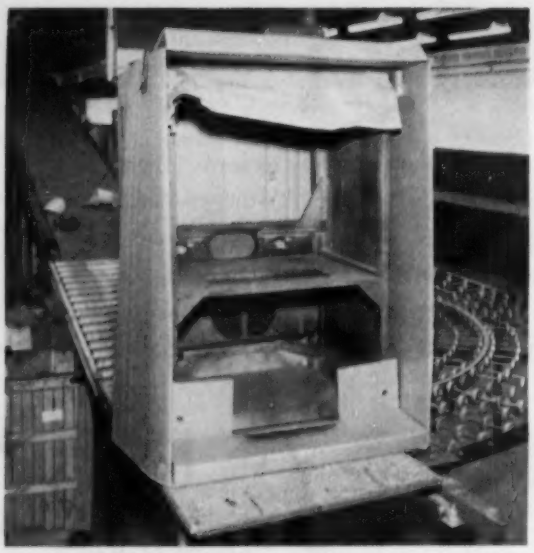
"Peep-

by Frank Glover
Chief Cabinet Engineer
Bendix TV and
Broadcast Receiver Division
Bendix Aviation Corp.



CORRUGATED CARTON in which television cabinets are received at the Bendix plant is taken directly to the assembly line. There it is opened and flaps are folded back. Temporary clamps hold flaps out of way.

ASSEMBLY LINE is a simple straight conveyorized operation. The cabinet remains in its shipping carton while the chassis and the picture tube are installed. Method has saved considerable space alongside line.

Hole" Carton

cuts assembly and distribution costs

WHEN the Bendix Television Division of Bendix Aviation Corp. found itself in a space squeeze within its Towson, Maryland plant, it solved the problem by developing a radically new shipping carton for TV sets.

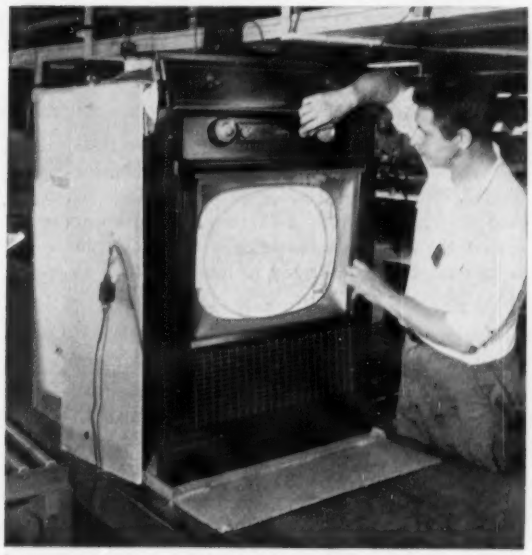
Caught between an expanding government contract business and a growing TV sales volume, Bendix industrial engineers discovered that their cabinet line was rapidly becoming one of the major bottlenecks in the plant. Space economy had pared away much of the area formerly used by the cabinet line until it was simply a moving, straight line conveyor belt from one end of the plant to the other. Cabinets arriving from the vendor were uncrated at the dock; then placed on the conveyor side-by-side with the empty conventional shipping carton. At the end of the line, the cabinet—now containing a complete TV set—was re-crated in its adjacent carton and moved to the shipping area.

This narrow line worked well as long as there were no hitches in the production of the sets. However, as soon as the repair section of the line became overloaded, the combined volume of cartons and TV sets awaiting repair choked off the line and often forced it to stop. The obvious solution to the problem was to find space inside the repair section to store the TV sets and their shipping cartons. But the sad fact was that getting additional space was out of the question.

The industrial engineers took the problem to the Cabinet Engineering Department and a solution was worked out. . . .

It was decided that if it were possible to assemble the TV set inside the cabinet without removing the cabinet from the shipping carton, a 50% saving in

(Continued on page 155)



FINAL TESTING and adjusting of completed Bendix television sets is accomplished without removing them from cartons. Sets are mounted on sliding corrugated bases and both back and front flaps can be opened.

PEEP-HOLE CARTON has been responsible for big production and distribution savings. When dealer wants to check a set, he merely opens bulls-eye, pulls out cord, plugs in the set, peeks in to watch operation.

STRADDLE-TRUCK may be used to haul pallet-bodies about yards and for loading trailers. Note locking devices on bed of trailer. They may be folded down flush with bed, permitting trailer to be used for other jobs.

New Idea in "Piggy-Back"

. . . Increases Speed
. . . Adds Flexibility

FORK-LIFT TRUCK with 30,000-pound capacity can be used to load bodies on flat cars. Locks work automatically with insertion and withdrawal of forks.

PALLET VERSION of body can be placed on dolly adapted with locking devices and used for transporting skid boxes anywhere in plant, for handling scrap, etc.) Entire load is easily transferred to flat-bed truck.

ONE of the most versatile methods yet devised for so-called "piggy-back" transportation is one based on the use of a van, or pallet-body measuring 17 feet long, eight feet wide and eight feet high. It is a development of Clark Equipment Co. Where previous methods have been limited to hauling of standard highway trailers on railroad flat cars, this development provides for hauling on almost any type of vehicle.

The pallet-bodies have been designed so that three may be loaded on a standard flat car, two on a conventional 35-foot highway trailer and one on a city delivery flatbed truck. Merchandise is loaded into the bodies at the shipper's loading dock. During loading, they may be mounted on a flatbed truck, or, if a proper capacity fork truck or straddle truck is available, they may be loaded at ground level. Once loaded, the bodies are easily placed on a truck, trailer or flat car.

Following delivery, the units can be removed from vehicles and used as convenient storage structures for materials not needed immediately. Capacity of each pallet-body is 20,000 pounds. When empty, they weigh 3000 pounds.

A simple pin-and-eye type locking mechanism holds a unit securely in place on freight car or trailer. The mechanism unlocks automatically when forks are slipped into channels underneath forlifting. When the load is deposited onto a carrier, and forks are withdrawn, the body is automatically locked in place. The locks have been unaffected in humping tests at speeds up to 20 miles per hour.

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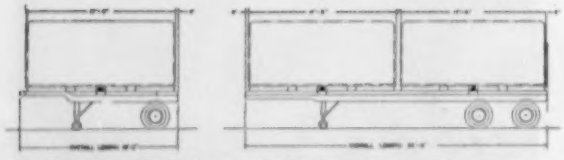
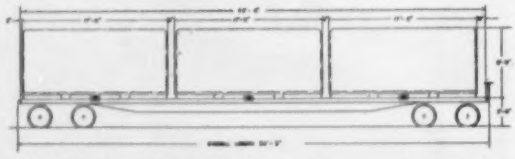


TRUCKS, TRAILERS AND FLAT CARS can be adapted for hauling vans. Adapting vehicle with locking devices is simple and relatively inexpensive. System is extremely flexible because vans may be placed on



flat-bed delivery trucks for delivery to terminals, transported any distance by rail or highway trailer, delivered on flat-bed trucks to the receiver, and, if necessary, stored outdoors until contained material is needed.

Convenient parts storage in labeled bin-type Generalifts. Can easily be altered or moved to meet changing conditions.

Generalifts themselves are easy to store, arrive flat in palletized loads, go together fast without nails. Many types available.

Storage story: another way Generalift pallet boxes help cut handling costs

Light or heavy, bulky or compact . . . there's a Generalift pallet box that's right to handle your product. And there's a General Box man ready to help you get the Generalift pallet box that will prove the most useful, last the longest, cost the least. He's backed by the finest container testing and design laboratories in the industry. To have him call, consult your local directory, or write direct. Ask for your copy of "New Cost-Cutting Uses for Generalift Pallet Boxes."

Factories: Cincinnati; Denville, N. J.; East St. Louis; Detroit; Kansas City; Louisville; Milwaukee; Sheboygan; Winchendon, Mass.; General Box Company of Mississippi, Meridian, Miss.; Continental Box Company, Inc., Houston.

Engineered Containers for Every Shipping Need

• Wirebound Crates and Boxes • Generalift Pallet Boxes • Corrugated Fiber Boxes • Cleated Corrugated and Watkins-Type Boxes • Stitched Panel Crates • All-bound Boxes.

General Box

1847 Miner Street, Des Plaines, Illinois

★ ★ ★ ★ ★

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Food-Type Cans Cut Costs in Industrial Applications

A UNIQUE packaging method for precision-made anti-friction needle rollers is providing big savings for The Torrington Co. and its customers. Torrington is one of the world's largest manufacturers of anti-friction bearings.

The new packaging method involves the use of tin-lined steel cans as shipping containers. Each can holds from 25,000 to 35,000 rollers in a vacuum. For shipment, sealed cans are placed in corrugated one-can-high containers. Two such containers are then strapped onto single faced wooden pallets for easy handling and transportation.

Savings for Torrington and its customers result from the improved packaging and the reduced handling at both ends.

Formerly, the needle rollers were packaged in cotton bags with stitched-on identifying tags. Before being placed into bags, they were coated with a slushing compound. At point of receipt, customers had to clean the rollers through an expensive, time-consuming process. Handling procedures were complicated and, at best, unsatisfactory. Shifting loads

HOPPER feeds needle rollers into food-type one gallon cans at The Torrington Co. Filling of hopper is simple matter for one man with 500-pound hoist and basket.

COUNTING SCALE is used to check each can of needle roller bearings to prevent shortages. Average can holds from 25,000 to 35,000 and weighs 100 pounds.

VACUUM SEALER insures protection against unfavorable atmospheric conditions. Formerly, rollers were coated with a slushing compound before packing in bags.

STEEL STRAPPING is placed around two one-can-high corrugated containers in which cans of needle rollers are shipped. Unit loads result in fast, easy handling.

—due to improper stacking, or sudden moves in transit—sometimes resulted in broken bags and ruined rollers. Fingerprints, dirt and perspiration also invited corrosion to the precision ground surfaces.

Torrington reports that with the vacuum sealed, food-type, gallon-size cans rollers are received by customers in exactly the same condition as when they received their final inspection. Both pre-shipment oiling and post-shipment degreasing have been eliminated.

Rollers may be placed into a product directly from the shipping containers and, as a result, not only is time saved, but the possibility of corrosion is reduced.

IDENTIFICATION LABELS are adhered to tops of cans and they are placed on corrugated base for conveying to shipping department. Cans are then put into cartons.

One of the twelve strapping stations set up by Quaker Export Packaging Co. to handle "Operation Poinsettia."

Signode power machines strap 600,000 cartons of food for export in 30 days!

Start November 14th and package 3,592,500 food parcels for shipment overseas in time for Christmas? It was done—in an amazing demonstration of fast organization and sustained effort, with the parcels packed six to a carton, cartons sealed, and reinforced with two steel straps.

Says Benjamin Bernstein, President, Quaker Export Packaging Co., Inc., Philadelphia, "In approximately thirty working days we applied over 1,250,000 straps. During the entire operation there was no major breakdown. This proves the excellence of the design and engineering of the machine, and the excellent service and installation."

This is unitizing on a big scale (and on a hurry-up basis . . . in little more than a week after the first call from Quaker Export, Signode had delivered the power strapping machines and set them up for operation).

Dependability—and experienced, helpful follow-through—are part of every item in the complete line of Signode hand and power tools for tensional steel strapping. For additional information, or a survey of your needs, write,

SIGNODE Steel Strapping Co.

2618 N. Western Ave., Chicago 47, Ill.

Offices coast to coast—Foreign subsidiaries and distributors world-wide.
In Canada: Canadian Steel Strapping Co., Ltd., Montreal • Toronto

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the price of a postage stamp
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Ask for THILCOTUF if you, too, are interested in THILCO'S non-staining, elasticized blend laminated papers.
...buys all this brand identification
PERMALUX
ON A THILCO PRINT-DECORATED
PROTECTIVE PAPER!
Adding "salesmanship" to this upholstered sofa protective wrap cost the Chittenden and Eastman Company just 2.3¢ . . . powerful advertising value with brand identity at less than the cost of a first class stamp! Specifically, C & E's attractive, trademarked wrapper is a non-staining blend laminate, fibre reinforced paper for unusual strength — safer product protection. All, for an amazingly low unit cost.
WHAT ABOUT YOUR PRODUCTS?
Let Thilco Print-Decorated papers add selling power and protection to your wrappings. Available in a wide range of base papers and treatments up to 10' wide, Thilco grades meet packaging's most exacting requirements, whether for a spool of thread or a carload of machinery. What's your wrapping problem?
UP TO 10 FEET WIDE
without lap or seam!
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ASPHALTED WATERPROOF BARRIERS, WAXED MOISTURE-VAPOR BARRIERS, GLASSINES and GREASEPROOFS, POLYETHYLENE TREATED PAPERS, SPECIALTY KRAFTS and SPECIALTY BAGS
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CONTAINER SEALS . . .

(*Continued from page* 138)

tests we also measured the deflection of the container's shock mount system. By reproducing the deflection on a package's shock mount system on the conbur ramp, we are able to simulate railroad loadings closely enough for equipment tests. We have found that an adequate test requires the ramp dolly to travel 9½ feet (producing a speed of seven miles per hour), impacted against two 4x4-inch pine blocks perpendicular to the grain.

Package Over-Designed

The incline plane test which we use is defined by ASTM D-880-47. As was stated earlier, packages tested to this criteria have given no difficulty in the field. It may be that we are over-designing our package to some extent. If such is the case, we are not too concerned because the weight and reinforcement used in our container designs are largely dictated by handling loads rather than expected shock loading.

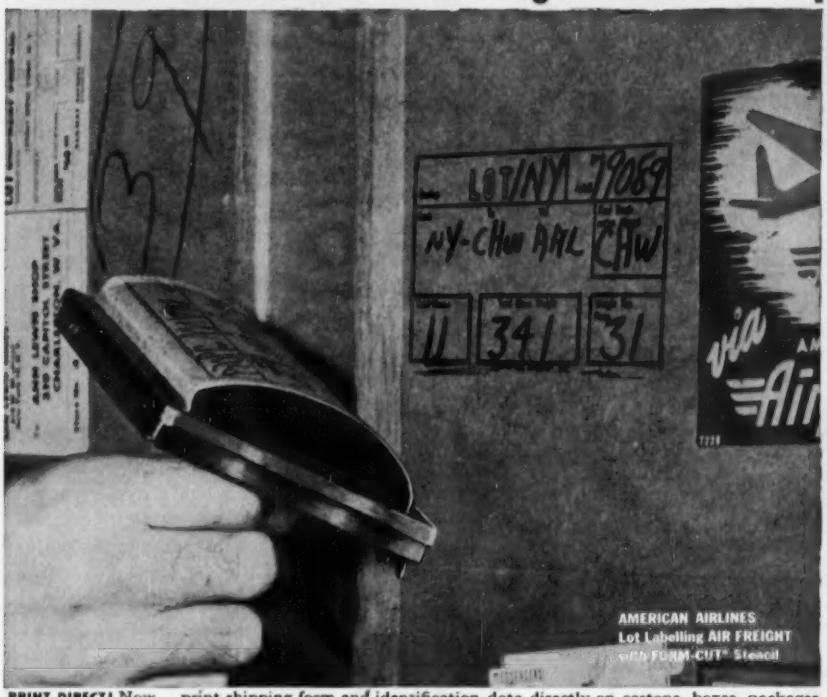
Following is a general review of our methods of performing tests to evaluate the effectiveness of suspension systems within our container in retarding the effects of vibrations encountered in shipment by railroad, truck cargo, aircraft, or ship. (It is, of course, desirable to test the contained item prior to and after the test to determine if it has been damaged during the test.):

About the Tests

The test article in its container is mounted on a vibration table and subjected to vibrations along each of three mutually perpendicular axes. The container is attached to the table in a manner which simulates the method used in actual shipment, and the tests are performed in accordance recommendations in TABLE A. The test article need not be operated during the tests, but it shall be satisfactorily operated after the tests.

If it is known that extreme temperatures will not affect the physical properties of the fabrica-

MULTISTAMP® STENCIL DUPLICATOR—The Original Hand Stamp Stencil Duplicator



PRINT DIRECT! Now . . print shipping form and identification data directly on cartons, boxes, packages in one operation. Eliminates the cost of labels and affixing them to cartons. FORM-CUT* stencil has facsimile of your label or shipping form die-impressed into the stencil. Attach it to the *MULTISTAMP* duplicator and get 1,000 or more clear, sharp copies from one stencil, without re-inking. Shown above, the popular No. 3 *MULTISTAMP** Duplicator—complete outfit (below) with supplies, $19.50.

Quick! Clean! Accurate! Speeds Up Freight Marking and Lot Labelling

"Solved our marking problem!" say users everywhere. "Licked our shipping tag and label addressing bugaboo." "Tops anything we've seen for marking boxes, cartons, and packages." For over 30 years the biggest names in industry and shipping have used portable, non-mechanical, inexpensive *MULTISTAMP* duplicators.

Just type, write, trace or draw on low-cost stencil and snap in position on the *MULTISTAMP* duplicator. Then print . . print . . print—just like using a rubber stamp. Made of non-corrosive metal to last indefinitely . . no moving parts to wear or repair . . low-cost *replaceable* ink pads.

MANY OFFICE USES, TOO. The *MULTISTAMP* Duplicator is also ideal for printing postcards, office forms, bulletins, notices, reports, advertising matter, price lists, even full-page letters and menus. It's so handy it is often used as an emergency "rubber stamp" . . takes but a minute . . costs about 2c. Where hairline registration is required (such as for printing "fill-ins" on printed forms, or printing the full area of postcards) printing guides are available.

*REGISTERED TRADE MARK ©1955, M. C.

There is a size for every duplicating need. 8 complete outfits, $9.50 to $99.50, f.o.b. factory. Write for descriptive literature or see your Office or Shipping Room Supply Dealer. The popular "No. 3" outfit pictured at right, is of suitable size for printing directly on cartons as shown above, as well as for printing postcards and large shipping tags; and includes the duplicator, 12 stencils, ink, ink brush, writing board, stylus pen, type cleaner, correction varnish, and complete illustrated instructions in a handy durable case . . $19.50, f.o.b. factory.

MULTISTAMP
STENCIL DUPLICATOR
MANUFACTURED ONLY BY THE MULTISTAMP CO., NORFOLK, VIRGINIA

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NORFOLK, VIRGINIA

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Complete with permanent copy

$31.75 F.O.B. N.Y.

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Prints up to 12" of copy
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CONTAINER SEALS

Continued

tion materials in the test article or container, the tests shall be conducted at room temperature and the temperature range recorded. If, however, the extreme temperature effects are not known or are known to vary the physical properties of the material significantly, tests shall be performed with the temperature of the test article stabilized in each frequency range at −65°F for one-fourth of the test period; at room temperature for one fourth of the test period.

Tested To Limit

Equipment is tested to the above criteria to the limit of available test facilities.

To test the effectiveness of container seals we pressurize containers with freon gas and check for leaks with freon indicators. Such tests as salt spray, dust, and sand are performed in accordance with MIL E 5272.

Circle No. 35 on Reader Service Card

The New B-LINE PORTABLE PAPER CUTTER
. . . brings the paper to the job!

Two Sizes: Model B-48 handles rolls of kraft paper 36" or 48" width—Model B-72 for 60" or 72" width. Up to 12" diameters. Hundreds in use by factories & warehouses thruout USA and Canada. Write for free folder.

THE S. J. BINA CO.
Box 5, Grand Forks, N. Dak.

Ruling Permits Auto-Nailers on Cleated Plywood Panels

Efforts of the Armed Forces to cut costs all along the line have brought out Amendment-1 to Federal Specification PPP-B-601 (which has superseded JAN-P-105 and NN-B-601b) which reads "6.5.1 One type of fastening that has been found satisfactory for securing plywood to cleats is the type formed from a roll of knurled wire in a machine that drives the fastener through the cleat and plywood and the fastener is clinched into the plywood."

Auto-Nailer minimizes splitting, saves production time—resulting in lower cost of shipping containers without sacrifice of structural integrity. This Amendment-1 confirms the experience of many wood fabricators who have used Auto-Nailers profitably over the years.

Auto-Nailer makes panels fast

Cross-section of cleat attached to panel by Auto-Nailer. Auto-Nailer makes, drives and clinches a special knurled wire nail . . . 3 nails-a-second.

Write for free catalog

AUTO-NAILER CO. 265 Marietta St., N.W. Atlanta, Ga.

Circle No. 170 on Reader Service Card for more information

Not when you use KIMPAK 301!

New KIMPAK 301 is the practical solution to surface damage to furniture finishes during shipment. KIMPAK 301's ability to shield the fine finish against scratching makes it the ideal protective agent in a furniture package. KIMPAK 301 costs no more than ordinary materials. It is specially designed to protect against the major causes of scratching:

1. Abrasiveness of the inner spacers. KIMPAK 301 provides a scratch-free, non-disintegrating, compressible barrier between inner spacers and the furniture finish. Its conformability ensures a snug package.

2. Dust, dirt, cinders that sift into the container. The combination of high creping and porous structure—exclusive with KIMPAK 301—provides a trap for dirt, grit or cinders, which may lodge between the packaging material and the polished surface.

3. Abrasive action of harsh packaging materials. KIMPAK 301 is soft and non-abrasive . . . free from wood splinters, dirt and other abrasive materials. No lumps, hard glue spots or stiff wrinkles.

Scratching is but *one* of many problems encountered in furniture packaging. These problems are *solved* when new KIMPAK 301 is specified. For more details, contact your local KIMPAK distributor, or mail coupon below.

SPECIFY KIMPAK 301 TO SOLVE THESE INTERIOR PACKAGING PROBLEMS:

- Scratching
- Pressure-marking
- Staining
- Chafing
- Conformability
- Ease of handling
- Disintegration

Whatever your protective interior packaging requirements, there is a Kimpak specification that does the job... better!

Kimberly-Clark
INTERIOR PACKAGING
KIMPAK

KIMBERLY-CLARK CORPORATION
Neenah, Wisconsin

We would like to learn how new KIMPAK 301 can provide better protection at lower cost for our products. Please send complete information.

Name .....

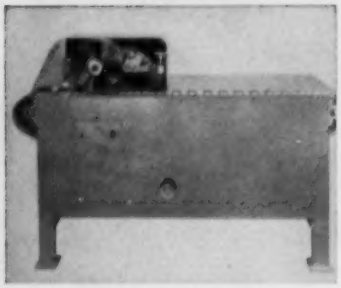
Firm .....

Street Address .....

City ..... *Zone* ..... *State* .....

Circle No. 102 on Reader Service Card for more information

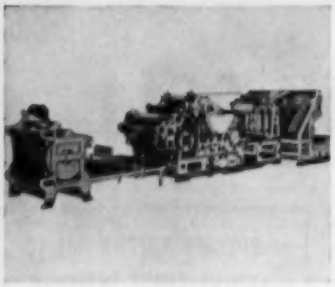
WHAT'S NEW... in Packaging and Shipping Equipment



Adjustable Flat Surface Printer

Model 65A, a flat surface printer made by Markem Machine Co., will print complete label detail on objects up to 30 inches long. It is manually fed and uses a sponge-backed rubber printing plate. Multiple printing heads are available for multiple color printing. Maximum size of imprint is 1¾ inches wide by 30 inches long. Operating speed depends on object size and rate of manual feed.

Circle No. 269 on Reader Service Card for more information



Automatic Can Bag Machine

The Model 17 Can Bag Machine of Potdevin Machine Co. is claimed to be the only machine that will make a variety of satchel bottom bags in one automatic operation. It makes bags up to 34 inches long by 48 inches wide by 21 inches bottom width, using a kraft web for the body and a chipboard web for the bottom. It is one of the largest machines made by Potdevin.

Circle No. 270 on Reader Service Card for more information

Adjustable Tape Dispenser

Lipton Mfg. Co. has introduced the "Model 60" Walters Automatic Sealer with front-press-down handle. It features a convenient handle with "Econo-Miser" for tape length control. A simple screw allows you to set the measuring stop to any desired length of tape. The machine takes 500-foot rolls of outside-gummed tape from ¾ inches to 1½ inches wide. It feeds, automatically moistens, and cuts 7½-inch long strips.

Circle No. 271 on Reader Service Card for more information

Do-It-Yourself Paper Shredder

The Marvel Paper shredder was designed by Van Dyke Industries to give a clean, rapid source of shredded paper for packaging and shipping operations. It is claimed that the freshly cut paper posseses more volume than ordinary commercial shredded paper because it is not baled and contains original resilience. Shredders are available in sizes ranging from a small portable model to a heavy commercial size.

Circle No. 272 on Reader Service Card for more information

"BEST OF THE SHOW" PACK IN SIPMHE PACKAGING SHOW

made with Celotex Industrial Board!

Grand Prize-winning container, also First Place winner in Export Class, shows prefabricated Celotex Fiber Board inner packs contoured to exact lines of aircraft brake surfaces for snug, immobile fit.

Right: Mr. Earl Gustin, designer, indicates center fiber board dowel-pin which assures firm "fixing" of brake for added protection.

Engineered, Prefabricated Inner Packs

• Brace, Block, Cushion! • Lower Packaging Costs! • Help End Shipping Hazards!

Blue Ribbon honors at the recent SIPMHE Show were presented to an aircraft brake package . . . using rugged, protective prefabricated inner packs of Celotex Industrial Cane Fiber Board!

This "Best of the Show" pack awarded the Irving J. Stoller cushioning trophy, was designed by Earl Gustin, Packaging Engineer. It won First Prize in the Export Classification, and was then judged best among all entries in this National Protective Packaging Competition.

Approved by the Services for spare parts shipment, the aircraft brake is now sent with minimum weight and labor and in maximum safety. Inner packs consist of two pre-contoured blocking pads and center dowel-pin; these thoroughly position, secure the brake, protect it from shock in transit and handling. This new method costs 75% less than packing of item in wood blocking.

Precision Fabricated as Required

Manufactured from long, tough Louisiana interlocked cane fibers, the strong Celotex board from which inner packs are made is extremely light and resilient. Because it can be prefabricated to exacting product contours, it tightly braces, position-blocks, and cushions with gentle firmness, preventing movement and impact damage. Its rigidity, strength, and cushioning often make the use of lighter, less costly outer containers completely practical.

Outstanding physical characteristics of Celotex Fiber Board: Has a neutral pH value (6.5-7.5); this low acid-alkali content is helpful in minimizing corrosion when in contact with metals. Moisture content is between 5% and 8% by weight, far less than most inner pack materials, requiring less costly desiccant.

Locally engineered prefabricated Celotex Industrial Cane Fiber Board inner packs can help solve problems of limited packing time and shipping space . . . can substantially reduce labor and damage costs. Name of your nearest fabricator on request. For full data, mail handy coupon today!

For proven packaging at its quick best . . .

CELOTEX

REG. U. S. PAT. OFF.

INDUSTRIAL CANE FIBER BOARD

THE CELOTEX CORPORATION • 120 SOUTH LA SALLE STREET
CHICAGO 3, ILLINOIS

MAIL COUPON NOW FOR FREE BOOKLET!

The Celotex Corporation, Industrial Dept. F-34
120 South LaSalle Street, Chicago 3, Illinois

☐ Please send me your free booklet, "Cost-Saving Packaging."
☐ Please furnish me a copy of the Celotex cushioning nomogram.

Name ..... Position .....
Company ..... Address .....
City ..... Zone ..... State .....

Circle No. 140 on Reader Service Card for more information

Circle No. 164 on Reader Service Card for more information

ARROW TACKERS

FASTER, EASIER, NEATER, MORE EFFICIENT

No. HT-50

TAGS AND LABELS ARE ATTACHED IN A JIFFY.

3 MODELS TO CHOOSE FROM. USES STAPLE SIZES UP TO 9/16" LEG.

HANDY FOR FASTENING PROTECTIVE LININGS AND PADDINGS IN CLOSE CORNERS.

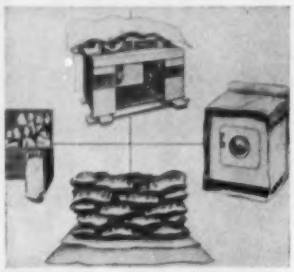
No. T-50

SOLD AT HARDWARE, BUILDING, LUMBER DEALERS AND INDUSTRIAL TOOL SUPPLIERS. WRITE FOR CATALOG

ARROW FASTENER CO., INC.
ONE JUNIUS STREET, BROOKLYN 12, N. Y.

Multi-Purpose Cushion Pads

Jet-Pak multi-purpose cushioned pads and blankets are constructed with macerated cushioning sealed within double walls of sturdy, moisture resistant kraft.



The manufacturer, Jet-Pak, Inc., reports that they meet Consolidated Freight Classification requirements for Class 1. The pads are available in a wide range of sizes from 4 x 12 to 30 x 96 inches. They are said to be adaptable for shipping any number of products including furniture, instruments, perishable foods, drugs, and liquids. In addition to its cushioning properties, the material has insulating and waterproofing effects when applied in conformance with standard shipping practice.

Circle 273 on Reader Service Card for more information

Friction-Driven Coding Machines

American Marking Corp. has introduced three new model coding machines—Micro Coder Nos. 20, 22 and 23. The machines are friction driven by contact with articles, large or small, usually on a conveyor system. All Micro-Coders have

FREE TRIAL in your plant

the IDEAL 200E Electric CLIP-A-TAPE

Push a button . . . get the exact tape length desired

Save 20% to 45% in TIME and TAPE

Proven by actual use in plants

WRITE *for free trial to*

IDEAL STENCIL MACHINE CO.

104 IOWA AVE., BELLEVILLE, ILL.

Circle No. 129 on Reader Service Card for more information

BIGELOW GARVEY PALLETS

Use B-G Two-way or Four-way Pallets for shipping, handling and stacking.

B-G HARDWOOD OR SOFTWOOD PALLETS. MADE IN ALL SIZES AND STYLES FOR ANY CAPACITY.

Write Today

BIGELOW-GARVEY lumber company

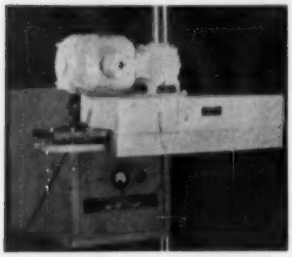
Circle No. 182 on Reader Service Card

three rollers (felt ink roller, rubber transfer roller for smooth, even ink distribution, and type roller.) Two micrometer scale dials, one to adjust the transfer roller to the type roller and the other to adjust the transfer roller to the ink roller, make it easy to install and adjust the marking machine so that all three rollers rotate together for correct contact with the article being printed. The machines are supplied with 360-degree re-set for standard operations.

Circle 274 on Reader Service Card for more information

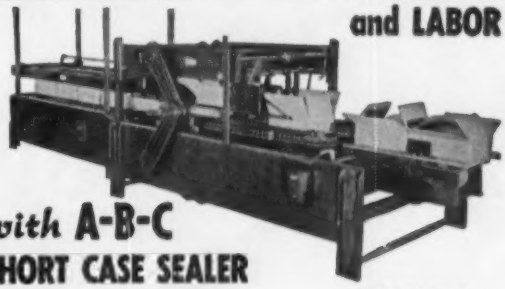
Electronic Bag-Top Welder

Electronic Processes Corp. has announced the Model 525 Ectrotherm Continuous Electronic Bag-Top Welder, a unit said to fill the need for a high-speed closure apparatus capable of integration into a packaging production line. A filled open-top bag is fed either automatically or by hand into one end of the welder. There, it is gripped by continuously moving belts and carried through the unit positioned between a continuous over-riding buffer strip and the continuously-firing high-frequency electrodes, pro-



Circle No. 108 on Reader Service Card for more information

Save
FLOOR SPACE and LABOR

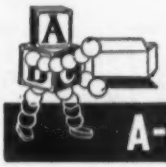


with **A-B-C SHORT CASE SEALER**

Save two-thirds of your valuable floor space with the A-B-C Short Case Sealer—with increased packaging efficiency, more speed, less expense . . . Automatically glues, folds and seals either or both top and bottom flaps of shipping cases in one operation. Made in eight models to fit any production requirement. Hot air heaters dry the glue in one-half the time. Speeds up to 30 cases per minute.

TOP QUALITY CASE HANDLING EQUIPMENT

Whatever your packaging job, A-B-C has a production proved machine for you—case sealers, unloaders and unscramblers, side sealers, and hand gluers.



WRITE NOW FOR DETAILS AND FLOOR PLANS

A-B-C PACKAGING MACHINE CORP. QUINCY, ILLINOIS

PLAY SAFE *use* **INLAND ROUND STEEL STRAPPING**

It's "Uni-sized"

"Uni-sizing" is a special Inland process which holds Inland Round Steel Strapping to very close tolerances with resulting smooth and relatively frictionless feeding in all makes of round steel strapping machines. This, plus proper tensile quality for your specific use (ranging from standard to high tensile quality), insures a strapping that will go all the way — anywhere — with any shipment and reach its destination safely. Also, Inland Round Steel Strapping is fast and economical to use.

Finishes — galvanized and coppered. Also available in painted colors.

Gauges — 8 through 19 incl.

Packaged — 50 lb. coils and 25 lb. packages.

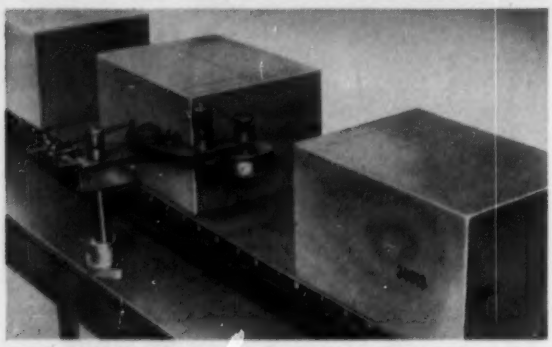
Put Inland to the test NOW!
Write for complete information!

INLAND WIRE PRODUCTS COMPANY
3960 South Lowe Avenue, Chicago 9, Illinois

Circle No. 73 on Reader Service Card for more information

Circle No. 79 on Reader Service Card for more information

Now... mark all 4 sides of cases automatically... *in a single pass*



Twin-action Gottscho ROLACODER Markers attach to conveyor or case-sealer

New friction-driven marking attachments enable you to mark codes or lot numbers on 2 or 4 panels of corrugated cases as they are sealed or conveyed... without requiring cases to be turned. ROLACODER *500* marker imprints front and one side panel, ROLACODER *200* unit imprints rear and other side panel — mounted in tandem they mark all 4 sides simultaneously. ROLACODER markers use quick-change rubber type, hold 8-hour ink supply; are designed for easy do-it-yourself installation.

Write for descriptive literature

Gottscho **ADOLPH GOTTSCHO, INC.**
Dept. D, Hillside 5, N. J.

Automatic CODING, MARKING, IMPRINTING MACHINES

In Canada: **RICHARDSON AGENCIES, LTD., Toronto & Montreal**

It's a wonder they're not using
ALLEGHENY *STEELBAND* STRAPPING

ALLEGHENY STEEL BAND COMPANY
BOX 716, PITTSBURGH 30, PA. • WAlnut 1-7100

Circle No. 13 on Reader Service Card for more information

viding a uniform seal made completely across the top. The unit operates with bags of any width. Use of the over-riding buffer, as well as design of the forming pressure rollers prevents contact between the plastic bag and the electrodes—obviating sticking, eliminating wrinkling, and also providing for rigidly accurate holding of bag edges before and during the weld.

Circle 275 on Reader Service Card for more information

Container Features Safety

Increased safety and ease of handling are major features cited for a new stackable carboy produced by the Industrial Safety Supply Co., Inc. The lightweight solid wood jacket and polyethylene bottle have been approved by the ICC. Called the Poly-Box Carboy, it is designed to fit ordinary acid-handling equipment and is available in 6½ and 13-gallon capacities. Produced for maximum safety, the carboy jacket features a safety filling liquid level slot. Triangular corner posts guard against damage from rugged use. The rectangular jacket has an opening in its base for easy and safe stacking.

Circle 276 on Reader Service Card for more information

ITS FELT TIP WRITES ON EVERYTHING!

in *BOLD* or *fine* lines

Marking steel drums, tools, parts, pipes, etc. is smooth sailing with the Flo-master Felt-Tip Marker.

The complete range of ten colors in Flo-master Inks permits speedy and accurate identification for assembling, stocking, inspecting.

Flo-master semi-opaque inks — waterproof, non-smudging, fast-drying — are recommended for hard-to-mark surfaces using the KING SIZE Flo-master. For general purpose marking—cartons, cases, etc—use Transparent Inks with POCKET SIZE Flo-master (illustrated).

Contact your supplier or write direct to Cushman & Denison Manufacturing Co., Dept. F-19, 153 23rd St., New York 11, N.Y.

Flo-master
FELT-TIP MARKER

Circle No. 76 on Reader Service Card for more information

Circle No. 60 on Reader Service Card

Protect your products from COSTLY SCRATCHES

Safely at less cost with flexible SOF-RAP

Save the surface and save plenty in damaged goods and returns. Whether it's costly printing plates or highly finished product surfaces, you can wrap best to protect with tough, durable, lightweight SOF-RAP — Single sheet Type C for interior cushioning against shock and vibration. Strip-laminated strong kraft and cushion duplex sheet to permit "slippage" — reduce friction damage. Thousands of uses. In rolls, sheet, tubes and bags. Get this FREE HELPFUL BOOKLET NOW!

NICHOLS
PAPER PRODUCTS COMPANY
GREEN BAY - WISCONSIN

"PEEP-HOLE" CARTON . . .

(*Continued from page* 141)

floor space could be made inside the critical repair section of the cabinet line. With this saving, the repair area would not choke up with both sets and boxes, stoppages in the line would be avoided and un-crating and crating time at both ends of the line would be saved.

Designing the New Carton

The Cabinet Engineering Department went to work on the design of a carton. Immediately, other advantages from such a carton became apparent. With all assembly being done while the cabinet was protected by the carton, damage to cabinets during production could be eliminated. This would eliminate the need to touch-up nicks made by hand tools.

The new shipping carton was designed to open from the front and back, allowing quick inspection or adjustments of sets by dealer or distributor. As an added feature,

Circle No. 139 on Reader Service Card

"It's Mail Master for us...

PURCHASING AGENT ...the extra strength, ease of closure and product protection makes me say we cannot afford to use a cheaper box."

1,000,000 Always In Stock

Write Dept. F1 for colorful catalog today.

THE Mason BOX COMPANY
ATTLEBORO FALLS, MASS.

...and a complete line of jewelry display boxes.

NOLAN ONE-MAN CAR DOOR OPENER

Opens Any Box Car Door in 20 Seconds or Less! $37.50 EACH

FREE LITERATURE

F.O.B. NOLAN CO., BOWERSTON, OHIO

THE NOLAN COMPANY
110 Pennsylvania Street, Bowerston, Ohio

Please send ☐ ONE MAN CAR DOOR OPENER at $37.50
☐ FREE LITERATURE

NAME .....

ADDRESS .....

CITY .....ZONE.....STATE.....

Circle No. 61 on Reader Service Card

THE MOST TALKED ABOUT GUMMED TAPE DISPENSER ON THE MARKET!

THE MEDIUM PRICED Super DERBY "152"

PRICED FAR LOWER THAN ANY COMPARABLE MACHINE!

Derby spent 2 years designing, building and testing the fabulous Super "152." It's a rugged, efficient, gummed tape dispenser with so many big machine features, so many unusual Derby exclusives, that its low price is truly sensational!

See your dealer or write Dept. F

DERBY SEALERS INC. Derby, Conn.

A Derby First! Cut-Off Blade Guaranteed for the Life of the Machine!

- Exclusive Spring Clutch Feed
- Feed Stop for Predetermined Lengths up to 30"
- Dispenses 1" to 3" width
- Auxiliary Water Reservoir
- Single Brush Moisture Control System
- Adjustable Variable Length Slotted Handle
- Interlocking Side Frames
- Automatic Tape Cut-off
- Visual Measuring Scale

Circle No. 18 on Reader Service Card for more information

"PEEP-HOLE" CARTON

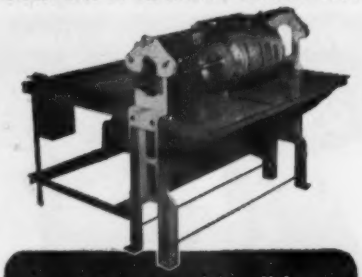
Continued

the peep-hole was added. This feature consists of a cut-out flap on the front of the carton. The A.C. line plug of the TV set is taped to this flap and a big red and yellow bull's-eye is pasted over the outside of the flap.

Now, when the distributor receives a TV set, he need only punch a hole in the bull's-eye, pull out the cord and attach it to an extension. Then, by peeping into the carton through the hole, he can see whether or not the set lights up. In this manner, it is possible to deliver a tested, operating television set to the customer in an unopened factory-sealed carton.

In production, the peep-hole carton works like this: A cabinet is received from the vendor in one of the cartons and is taken directly to the beginning of the cabinet line. There, the carton is broken open and the flaps are folded back against the side of the box. Flaps are held in position, out of assem-

Circle No. 68 on Reader Service Card



Imprint your multi-wall bags and shipping containers AS YOU NEED THEM!

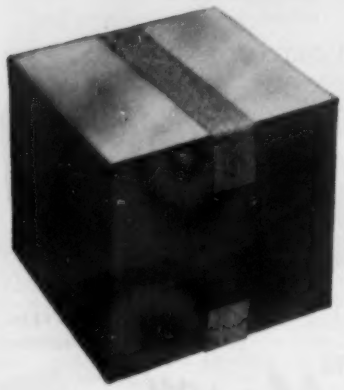
SPECIALLY DESIGNED FOR MARKING PROFITS – INDUSTRIAL'S AUTO PRINTER

You can forget surface variations with the Autoprinter because it accurately marks and codes up to 2400 neat, legible impressions per hour regardless of container surface condition. Installed in short order at amazingly low cost, the AUTOPRINTER requires little attention and maintenance... obsoletes slow, expensive manual marking. Write for details today. Now, 24 page catalog available on request. Dept. FM

IME Industrial Marking Equipment COMPANY, INC

454 Baltic Street, Brooklyn 17, New York — MAin 4-2601

THE SnakeTape IDEA...



use 2 strips only!

IT'S 2/3 FASTER because you seal only the two center seams!

IT'S 35% STRONGER because *reinforced* Snake Tape has strap-like strength. *Strength* you'll find in no other gummed tape because it's reinforced with *rayon* yarns... the same rayon yarns used in the best auto tires for superior shock absorbence.

PROVE TO YOURSELF, and at our expense, how much you can save in sealing time and in damage claims. Send for FREE sample of Angier Snake Tape now.

Free - 15 yd. sample

ANGIER CORPORATION
Framingham 13, Mass.

Circle No. 175 on Reader Service Card

MOTORIZED COIL LIFTER

SAVES STORAGE SPACE...
HANDLES COILS FASTER... SAFER

1 Lifter Handles Both Wide and Narrow Coils With Same Speed and Economy

This C-F Coil Lifter, under control of the Crane operator handles hundreds of coils a day in a large mill... wide, narrow, and of varying tonnage. Fast, infinite adjustments of the motorized legs permit quick pick-up and set-down. Legs can be opened to any width and held... no need to open to maximum width to handle narrow coil. Maximum of 12" required between coils of any width—saves storage room.

Positive tong grip on coil tightens as lift is made... insures safe handling. Made in motorized models for crane cab or pendant operation as well as manual types with chain wheel, in capacities from 3 tons up. Powered Rotating Heads available. Opening ranges to suit your requirements. Write for Bulletin and complete information.

CULLEN-FRIESTEDT CO.
1320 South Kilbourn Avenue • Chicago 23, Illinois

Circle No. 37 on Reader Service Card for more information

blers' way, by temporary clamps. As the carton containing the cabinet moves down the assembly line, chassis, picture tube and control knobs are added to the set, all test procedures are performed and, at the end of the line, the clamps are removed. Finally, the carton (still the one in which the cabinet was received) is sealed and it is ready to be sent to the shipping platform for delivery to the Bendix distributor.

The cabinet line is unchanged from the one which was used before the change in packaging. It is a simple straight line operation. Now, however, stoppages are not caused by the choking up of the repair section by cartons and sets.

A final important advantage which results from the peep-hole package is apparent only in the dealers' showrooms or in customers' homes. The cabinet, inside the carton, is bolted to a corrugated skid. When the set is to be removed, the front of the box is opened and the set slides out easily. It is then a simple matter to remove the skid and the set is ready for use.

Circle No. 90 on Reader Service Card for more information

Farquhar

POWER-BELT AND GRAVITY CONVEYORS

materials handling CONVEYORS

Farquhar fully integrated bulk or packaged materials handling systems . . . portable or permanent . . . effect direct labor savings within production operations, as well as between operations. Get the facts about Farquhar Power-Belt and Gravity Conveyors today. See for yourself how you can cut your handling costs.

Write for our "Owners Report" or Bulletin No. 400 covering Farquhar Package Handling Conveyors.

OLIVER Farquhar CONVEYORS

A. B. FARQUHAR DIVISION

THE OLIVER CORPORATION, Conveyor Dept. M-06 York, Pa.

SAVE MANPOWER . . .

SPEED LOADING . . .

REDUCE COSTS

with MILWAUKEE MAGNESIUM

Dock boards for truck or rail

JOB-ENGINEERED Design, size and capacity to fit your needs.

SERIES F Full length position lock, 60 models, to 3000 lbs. capacity.

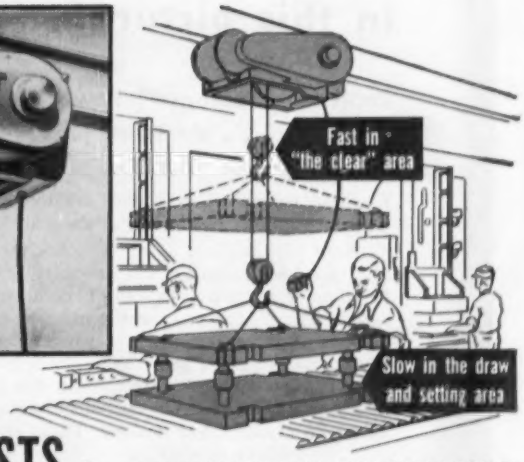
Let MPM representatives recommend a cost-saving answer to your loading problems, with job-engineered or standard dockboards.

MAGNESIUM PRODUCTS OF MILWAUKEE

750 W. Virginia St., Milwaukee 4, Wis.

DESIGNERS and FABRICATORS for INDUSTRY, COMMERCE and GOVERNMENT

Circle No. 97 on Reader Service Card



2 SPEED HOISTS for PRECISION HANDLING

When close, careful handling is required, the Detroit 2 Speed Hoist is especially suited. These hoists are in operation in die shops, machines shops and foundries. The low speed is a non-varying slow speed adequate for precision handling. In the clear, the hoist can be operated at full, high speed. Ask us for further information on Detroit, 2 Speed Hoists.

The New Detroit Trojan Monorail Tractor for easy attachment to existing hand traveled hoists. Ask for Bulletin 833.

DETROIT HOIST and MACHINE CO.

Designers and Manufacturers Since 1905

8265 Morrow St. · Detroit 11, Mich.

Circle No. 21 on Reader Service Card for more information

There's an easy way to raise profits for you in this picture!

Rapistan "Packaged" Power Conveyors cost Less . . . do more jobs

Rapistan power belt conveyors are standard units. They are interchangeable. Put them to work in different jobs anytime. They see more use, don't stand idle in a back room. When necessary, you can lengthen or shorten a Rapistan belt conveyor to suit new needs. That's making the most of an investment. Rapistan belt conveyors are safe investments, too, with pop-out rollers, guard rails, chain guards, gap plates and other features for worker protection. Put Rapistan belt conveyor together with Rapistan gravity conveyor, and you have a "controlled flow" system. That's economy!

ASK ABOUT BUILDING YOUR OWN SYSTEM with Rapistan "packaged" conveyor units. We'll send you literature showing how conveyors pay for themselves in profit increases and improved operations.

FREE ENGINEERING SERVICE is as close as your phone. Rapistan Sales-Service Agencies are located in major cities, ready to serve you. Distributors in most foreign countries.

Rapistan®
POWER CONVEYOR
The RAPIDS-STANDARD CO., Inc.
455 Rapistan Bldg. Grand Rapids 2, Mich.

Circle No. 80 on Reader Service Card for more information

SALES FIELD . . .

(*Continued from page 24*)

The Pope Equipment Company, Cincinnati, Ohio, will handle the complete line of **Nutting Truck and Caster Company** in the Cincinnati area. **Jack H. Pope** is president of the concern.

A new district office has been established in Charlotte, North Carolina, by **Whiting Corporation. Fred W. Fisher** will manage the new office and **Harvey K. Waters** will serve on the staff. Other assignments include **T. L. Iwan** to the Ardmore, Pennsylvania, district office as sales engineer, and **A. H. B. Stensland** to the Pittsburgh district sales office.

The entire Provinces of Ontario and Quebec, Canada, will be covered by **R. D. Travers Company** of Hamilton, Ontario, for **The Cambridge Wire Cloth Company.** Offices are maintained in Montreal, Quebec and Hamilton, Ontario.

Sales and service on **Bucyrus-Erie Company** equipment in central Tennessee is now offered by **Euclid-Tennessee, Inc.,** Nashville. The company is located at 720 Murfreesboro Road.

The Electric Storage Battery Company recently honored its Washington branch manager, **John A. Klingensmith,** on completion of 25 years' service. He is a graduate of the University of Pittsburgh, and is a member of the American Society of Naval Engineers and American Institute of Electrical Engineers.

Detroit district sales manager for **The Hinde & Dauch Paper Company** is **George T. Henderson.** A veteran of 20 years with the company, Henderson has had wide experience in both production and sales. He holds

several package design patents, and is well known for his work in both the United States and Europe. During World War II, he was the ranking civilian in the Army packaging organization.

Permacel Tape Corporation recently opened a new warehouse in suburban Detroit which is equipped with scientific controls. The warehouse was designed to expand service in the Ohio, Michigan and Kentucky areas, according to **William Bullock,** district manager.

Felix W. Sweeney, sales manager, **Wayne Shovel and Crane Division** of **American Steel Dredge Company, Inc.,** has announced the appointment of four new distributors. They are **Dravo-Doyle Company,** Pittsburgh, Pennsylvania; **Cary Hall Machinery Co., Inc.,** Salem, Virginia; **Industrial and Farm Equipment Corporation,** Baltimore, Maryland; and **George P. Williams Company,** Cleveland, Ohio.

Baldwin-Lima-Hamilton Corporation, Construction Equipment Division, has named three new distributors. **Kentucky Equipment Company, Inc.,** Louisville, Kentucky; **R. C. Larkin Company,** Chicago, Illinois; and **Industrial Tractor & Equipment Co., Inc.,** Nashville, Tennessee are the firms appointed by the manufacturer.

D. E. Rizor, vice president for sales and service of **Marion Power Shovel Company,** has been named to head the consolidated sales and service department of the Marion-Osgood-General lines. His association with the company extends back to 1925. **Kenneth O. Williamson,** sales manager, small machines, is concentrating his activities in the sale of equipment in sizes of four cubic yards and under through a distributor organization throughout the

There's a new way to cut costs for you in this picture!

New Rapistan FLOW RACK speeds order selection, adds storage space

Deep-storage FLOW RACK eliminates the need for many aisles in storage areas. This gravity conveyor racking system cuts down costly delays, provides fingertip access to inventory, speeds up order selection and turns "dead" aisle space into useable storage depth. FLOW RACK relieves employees of physical lift-and-lug, increases their per-hour value, and cuts overtime costs. FLOW RACK can be installed in a matter of hours by your own crew, without welding. It can be removed and reinstalled in another location, and can be extended either in depth or width at any time. FLOW RACK is available in standardized units for handling products of any size, weight or type . . . flat cartons, mattresses, bottled goods, small parts, foods and many others!

OUR FREE BOOKLET "FLOW RACK" contains many new money saving, time saving ideas for using FLOW RACK in production, storage, shipping, receiving and inventory operations in many industries. Write today.

Rapistan®
FLOW RACK
The RAPIDS-STANDARD CO., Inc.
455 Rapistan Bldg., Grand Rapids 2, Michigan

THERE'S A RAPISTAN SALES-SERVICE AGENCY near you, with factory-trained experts ready to serve you with experienced know-how. Distributors in most foreign countries, too.

Circle No. 81 on Reader Service Card for more information

There's a time saving new idea for you in this picture...

New Rapistan FLOW RACK lowers production costs by placing materials where they are used

Now you can conveyorize your parts inventory . . . and put it into working areas! And you have more orderly inventory control — with less walking, lugging and trucking. You can pack more inventory into any given space, too, by cutting out unnecessary aisle area.

You do it with Rapistan FLOW RACK, a new conveyor that moves materials by gravity . . . and puts them where they're needed.

New steel FLOW RACK is a low cost surprise, too. It's easily put in without welding and needs no maintenance.

SEE EXACTLY HOW RAPISTAN FLOW RACK CAN ADD more to your profit. A free booklet "FLOW RACK" is full of ideas and facts on how this new system does a better job in production, selection, accumulation, inventory movement and materials handling in all types of industry. Write today.

Rapistan® FLOW RACK

The RAPIDS-STANDARD CO., Inc.
455 Rapistan Bldg., Grand Rapids 2, Mich.

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SALES FIELD

Continued

United States and Canada. **Richard M. Bessom,** export sales manager, handles sales of the complete line through a worldwide organization of distributors abroad.

Don S. Permar has been named to fill the newly created post of field sales manager of the **Le Roi Division** of **Westinghouse Air Brake Company.** He attended Carnegie Institute of Technology, and joined Westinghouse in 1945. Also announced by the company was the appointment of **Paul D. Sullivan** as assistant sales manager. Sullivan will headquarter in Milwaukee.

The Revolvator Company line of equipment will be distributed in the Massachusetts area by **Carvill Associates** of Newton Highlands, Mass. Carvill, who heads the firm, is a former methods engineer of General Electric Company.

A new field sales office has been opened in New Orleans by **The Dow Chemical Company.** The office will serve the entire state of Louisiana and portions of Mississippi, Alabama and Florida. An important feature of the new facility is a complete teletype service which links it with all other Dow offices and manufacturing plants.

F. Henry Savage, vice president and general sales manager of **International Paper Company,** announced the appointment of **Lamar M. Fearing** and **William S. Snyder** as assistant general sales managers. Fearing joined the firm in 1924, and most recently served as sales manager of the Fine Paper and Bleached Board Division. Snyder joined International in 1941, and since 1949 has served as general manager of the Container Division.

FLOW Reports on Handling 'Round the Country

AUTOMATIC CHIP SYSTEM

Auburn, N. Y.—Since machining operations constitute a major phase of U. S. Hoffman Machinery Corporation's activities, particular consideration has been given to the problem of chip handling. The company has installed an automatic conveyor system to handle this troublesome waste product, with a resultant estimated savings of more than 800 man-hours per day.

Elements of the system include chip handling feeder conveyors, main-line conveyor, chip-crusher, pneumatic conveying system and storage bins.

Hoffman's machine tools are arranged so that chips and coolant discharge to three under-floor feeder conveyors which service some 40 machines and carry the chips to a main-line conveyor. The coolant is collected in troughs beneath the conveyors and is piped to a flotation unit which reconditions it and pipes it back to the machines.

Chips are carried to a crusher by the main-line conveyor. After being broken into small pieces, the chips drop into one of two discharge hoppers and through rotary feeders into air-lines which convey them into storage bins installed along a railroad siding. Operation of the bins is automatic too, as they discharge by gravity into hopper-bottom cars.

* * *

PROFITABLE PICKLE PLAN

Minneapolis, Minn.—Pushing pickles on the power plan has really proved profitable for Gedney's Pickle Plant. The company's use of a powered wheel barrow for movement of pickles from storage tanks to process tanks has increased the firm's handling efficiency 150 percent.

Previously, only four bushels of

There's a profit saving new idea for you in this picture . . .

Rapistan "Controlled Flow" Systems work smoother, pay profits sooner.

Controlled flow eliminates confusion and costly breakage . . . and gives you more profit. Rapistan alone provides "controlled flow" in gravity and power conveying systems because Rapistan gives you more controls and accessories to keep your line flowing smoothly and without interruption. For the utmost in convenience and utility Rapistan has exclusive accessories for automatic operation — spur curves, flow diverters and limit switches. For worker safety Rapistan has pop-out rollers, hinged plates over belt gaps, chain guards, full length belt conveyor controls bars and capacity features found in no other system.

WRITE FOR FREE catalog and actual field reports which show how RAPISTAN flow systems have solved materials handling problems for your industry . . . just tell us the business you're in.

LOCAL ENGINEERING SERVICE IS YOURS FREE . .
There's a Rapistan Sales-Service Agency near you, listed in your 'phone book. Distributors in most foreign countries.

Rapistan®
CONVEYOR SYSTEMS

The RAPIDS-STANDARD CO., Inc.
455 Rapistan Bldg. • Grand Rapids 2, Michigan

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pickles could be carried at a time. The new method of transporting by powered wheel barrow makes it possible to carry ten bushels in one load, and the process tanks are thus filled after only four trips, with little human energy expended.

Hands do not touch the pickles as they are loaded by conveyor into the wheel barrow which dumps them automatically into process tanks.

CROSS-COUNTRY MOVE TAXES MINDS, MACHINES

San Francisco, Calif.—The moving of a massive electric generator stator from the east coast to a rugged Pacific coastside location taxed a lot of minds, muscles and machines recently. Among the items used were an eight-axle freight car, an 82-wheel trailer, and enough lumber for a six-room house.

The 3100-mile move from the General Electric Company's turbine factory in Schenectady, New York to the Pacific Gas and Electric Company's power station now under construction at Morro Bay, California, became progressively more complicated as the huge 217-ton, 150,000-kilowatt generator moved westward.

The cross-country trip was simple, almost without a problem. But the 240 miles from Los Angeles to Morro Bay were an entirely different story because of long narrow railroad tunnels along the coast and the fact that the railroad siding nearest the power station site is nine miles away over Southern California foothills.

Engineers handling the job did not wait until the generator reached the West Coast to solve the problems of moving the giant load through narrow tunnels, from flat car to truck, and over roads designed for far less weighty burdens. They started planning more than two years ago.

Having heard of a man who had to tear down his house to get the boat out of the basement, they checked routes and clearances, even the possibilities of water shipment, before the generator's final contours were completed. By building it with removable cooling towers, there was a half-inch clearance even in the narrowest tunnels.

The 18-day cross-country railroad trip ended at Camp San Luis Obispo army base siding between San Luis Obispo and Morro Bay—still nine miles from the powerhouse site. Aided by powerful hydraulic jacks and heavy diesel truck winches, it took riggers 48 hours of 'round-the-clock labor to transfer the load from the 16-wheel low-bed flat car to a specially-built, highway-type, tractor-trailer combination. The enormous trailer was 89 feet long and 17-½ feet wide with 82 rubber-tired wheels. The combined weight of the generator and trailer rig was more than 275 tons.

Every foot of the nine miles of state highway between the Army Base and plant site had to be covered with three-inch thick planks, laid edge to edge across the road to protect the pavement. Even

Barrett PalletOx Model PX 4" lift cap. 4000 up to 6000 lb.

BARRETT PALLETOX

the low-cost "walk away" for loads up to 6,000 lb.

Barrett PalletOx walking type power lift truck is a money-saver on short hauls...load spotting... general pallet handling. Often eliminates expense of rider type power truck operation. PalletOx is made for fast operation—gets into tight corners—short turning radius—no lost-time gaps to slow down handling. 4" lift prevents floor snagging. Write for complete descriptive literature.

Hydraulic hand-lift models also available for loads up to 60" long. Capacities—2,500 and 6,000 lb., 4" lift. Release treadle to lower. Write for Bulletin 4861.

You will want Catalogs 551-1-2-3 on the complete Barrett "Walkie" type Power Truck. Your request will bring a copy.

BARRETT-CRAVENS COMPANY
614 Dundee Road, Northbrook, Illinois
Representatives in All Principal Cities
Canadian Licensee: S. A. Armstrong, Ltd., Toronto, Canada

Barrett Handling Equipment
BARRETT
ONE MAN DOES MORE THAN 3 OR 4...WITH A BARRETT

Circle No. 171 on Reader Service Card for more information

more protection was needed for the larger culverts.

A total of 550 new planks, each 20 feet long, 12 inches wide and three inches thick were used. A crew of 59 men working with crane trucks and lumber carrier picked up and laid down the planks 86 times as the giant load creeped over the nine-mile stretch. Eight days of continuous 24-hour operation were required to complete the move. By the time the job was finished, the crushing pressure of the heavily laden wheels, combined with the many handlings, had reduced the planks to kindling.

A second unit for the Morro Bay plant is expected to be handled in the same way next year.

* * *

"NEVER FAILING" BELT GETS YEARLY X-RAY

Hibbing, Minn.—After hauling more than 8,000,000 tons of iron ore on the Mesabi iron range over a seven-year period, the dependable rubber conveyor belt recently got an on-the-job X-ray checkup. Said to be the only belt of its service-age, regardless of manufacture, that has never required splice repair or replacement, the belt has been X-rayed once each year since its installation in 1948.

Steel cables, cushioned in rubber inside the belt and completely insulated from each other, form the muscles which give the belt strength to convey 1000 tons of ore an hour up an incline 350 feet above the open pit. X-rays explore the condition of the steel cables, especially in areas where the cables are spliced to form continuous loops through the 3300-foot belt. The belt operates at 30,000 pounds tension and travels 590 feet a minute.

* * *

MAGNET ASSURES QUALITY CHOCOLATE

Newark, N. J.—The rigorous policy of quality control established by Hooton Chocolate Company in the manufacture of liquid chocolate is not permitted to relax even after the product is safely in the mixing storage kettles awaiting shipment to customers. Every drop of the liquid chocolate as it is finally piped into tank trucks for delivery, must pass through a magnetic pipeline trap to make certain that no minute metal particle, from whatever source, can pass. Two of the traps are employed on the lines which handle chocolate in consistencies varying from light to heavy.

Makers of quality chocolate since 1897, Hooton supplies bulk chocolate to confectioners and manufacturers of ice cream, whose reputation is necessarily staked on the purity of the ingredients employed. Even though the metal particles removed by the magnetic unit are said to be so minute they could pass through a 300 mesh screen, the assurance of product purity and resulting customer goodwill afforded by this ultimate in control measures has proved to be a valuable asset to the company.

Model JE-3. 3000 lb. capacity

CRESCENT AISLE-SAVER

Solves Cramped Storage Space Problem

For fast maneuvering in narrow aisles and congested areas you can't beat a Barrett Aisle Saver! One operator does more than 3 or 4 using less efficient methods.

Battery powered for economy . . . engineered for durability. Stand-up and controlled . . . saves operator time getting on and off. Compact . . . short turning radii. Speeds up to 5 m.p.h. Forward, backward tilt.

5 models. Capacities 1000 to 4000 lb. Collapsed heights—68″ to 83″. Total fork lift 90″ to 130″. Free lift to 66″. Also available in non-telescopic models. Electric power. Special attachments—forks, crane arms, grabs, clamps.

You will want Catalog 5210 for complete aisle-saver information. Also, Catalog 535 on the complete Barrett line. Your request will bring you copies.

BARRETT-CRAVENS COMPANY
614 Dundee Road, Northbrook, Illinois

CRESCENT BARRETT

Barrett Handling Equipment

ONE MAN DOES MORE THAN 3 OR 4...WITH A BARRETT

Representatives in All Principal Cities. Canadian Licensee: S. A. Armstrong, Ltd., Toronto, Can.

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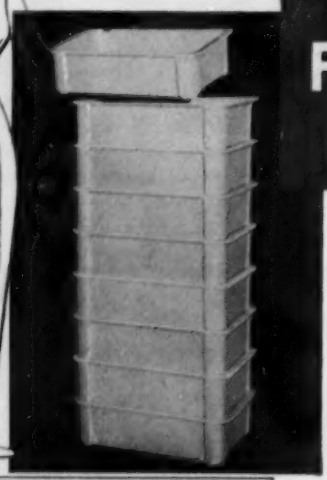
Circle No. 122 on Reader Service Card for more information

MOVE or STORE SMALL PARTS

IN THE NEW

FIBERGLASS TOTE BOX



* light but strong to carry greater payloads
* last indefinitely without maintenance
* tare weight is uniform . . . and they *lock stack*
* no sharp edges or corners; accident-free handling
* TOTELINE tote boxes are available in color for easy identification.

TOTELINE

Write for Bulletin 435

MOLDED FIBERGLASS TRAY CO.

LINESVILLE • PENNSYLVANIA

World's largest producers of fiberglass reinforced resin trays and tote boxes

SHELVING SYSTEM SAVES FOR PARTS DISTRIBUTOR

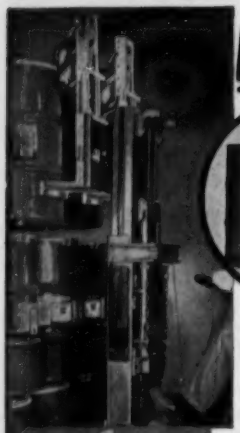
Philadelphia, Pa.—Sanson & Rowland, Inc., distributor of nuts, bolts and screws, has cut costs of filling orders and speeded customer services by installing standard adjustable steel shelving units in its new $250,000 building. A savings of $2000 a year in order picking costs alone is reported.

Besides the important savings in time and money, many other advantages of the shelving are pointed out. Shelving design now permits order pickers to see contents from any angle; quick accessibility of stock is afforded, resulting in simplification of inventory taking; better housekeeping is encouraged; shelves are fireproof; workers are less fatigued; and shelving can be adjusted for any future use.

* * *

OVERHEAD HANDLING INCREASES PRODUCTION

LaCrosse, Wis.—An overhead handling system which combines



NOW moves 32 drums an hour with ONE MAN! *

Formerly 16 Drums an hour with overhead crane and 2 men....

THE LIFT-O-MATIC POWER TRUCK ATTACHMENT for DRUM HANDLING

- **Simple** . . . One operator can attach or remove unit, WITHOUT TOOLS, in only 2 minutes.
- **Automatic** . . . Raising or lowering truck carriage provides automatic, mechanical pick-up and release. Additional operator controls unnecessary.
- **No Pallets Needed** . . . Move, tier or place drums quickly without pallets.
- **FITS *ANY* TRUCK**

* Case history on request

Write for Details

MARVEL INDUSTRIES, Inc.

2226 CLEVELAND ST., EVANSTON, ILLINOIS

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REVOLVATOR RED-GIANT features Safety-Ease

Durability — built in by 50 years of Revolvator Co. experience—is still the fundamental of the Red Giant liftruck line. Maneuverability, plus the safety of their exclusive double stroke mechanism, make the models shown leaders in their fields. There is a Red Giant liftruck available for every use—for every capacity.

Write for the full facts today.

REVOLVATOR CO.

8739 Tonnele Ave., North Bergen, N. J.

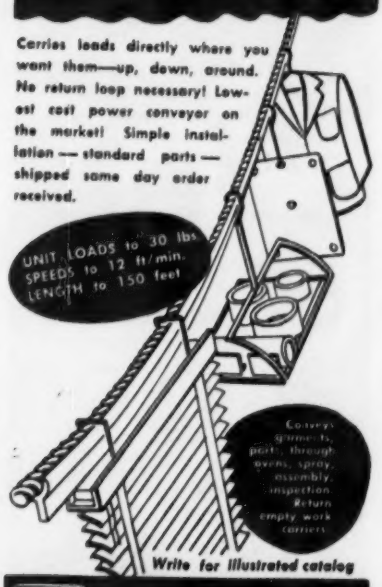
Circle No. 96 on Reader Service Card

Circle No. 135 on Reader Service Card

MONOFLO
The exclusive
ROTATING CABLE **CONVEYOR**

Carries loads directly where you want them—up, down, around. No return loop necessary! Lowest cost power conveyor on the market! Simple installation — standard parts — shipped same day order received.

UNIT LOADS to 30 lbs.
SPEEDS to 12 ft/min.
LENGTH to 150 feet



Conveys gimmicks, part through ovens, spray, assembly, inspection. Return empty work carriers

Write for illustrated catalog

M-H STANDARD CO.
STANDARD
51 SCOMMUNIPAW AVE., JERSEY CITY 4, N. J.

individual cranes for pouring in each of 27 production areas and monorail transport of hot metal to the area has helped Allis-Chalmers Manufacturing Company substantially increase the production capacity of its foundry.

In addition to mechanization of hot metal handling, many other benefits have been realized since installation of the new system. There is now more efficient use of floor space as molds can be stacked higher than was previously possible; reduced floor traffic has cut down on dust; employee morale and productivity has improved; and charging is faster and more efficient.

The system starts with the cupola. Transfer ladles of 1000 pounds capacity move to the tapping area on a monorail "sidetrack" which eliminates traffic jams between filled and empty ladles. The filled transfer ladle then moves on the main monorail line to the production floor.

Because of the faster handling made possible by the monorail, there is no need for a reservoir ladle; metal is poured directly into

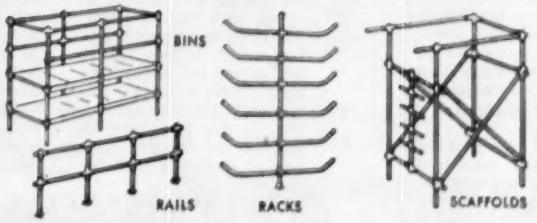
NOW! BUILD YOUR OWN Pallet Racks, Rails and Shelving... with

Nu-Rail SLIP-ON FITTINGS
AN ENTIRELY NEW METHOD OF FITTING PIPE

USE ANY I.P.S. PIPE OR TUBING . . . **NO PIPE CUTTING . . . NO WELDING**

Build them when and where you need them.

SAVE MONEY, too!



JOBBER INQUIRIES INVITED. *WRITE NOW FOR FOLDER AND PRICES!*
THE HOLLAENDER MANUFACTURING COMPANY
3826 SPRING GROVE AVE., CINCINNATI 23, OHIO

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No. 852 STEEL SIDE-DUMPING HOPPER TRUCK. Side gate hinged on bottom extends to dump load away from running gear. Wheels remain on ground when body is tipped. Body is 36" wide, 60" long, 18" deep. Fifth-wheel steer and turning yolk for power unit towing.

No. 833 TOWVEYOR TRUCK. Reduces dispatching and sorting time in motor terminals and warehouses. Rigid all steel, all-welded frame with hardwood platform. Plastic or rubber tired wheels. Grease seals available. Clip board for instruction sheets, messages. Box for trip or inventory cards.

No. 855 FIFTH-WHEEL STEER TRAILER TRUCK. Rigid all-steel, all-welded frame with hardwood platform. 48" wide x 96" long. Equipped with dual 16" wheels, 4.00 x 8 six ply heavy duty pneumatic tires.

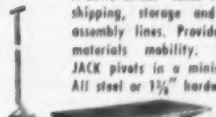
Towsley
TASK TAILORED
GENERAL and SPECIAL
FLOOR TRUCKS

The trucks you see can be adapted to many uses. We have many more economical general purpose trucks to choose from and top flight engineers to develop new ones for your special job. If you have a unique handling condition that requires special planning, write or phone Towsley first.

No. 509 MANY PURPOSE SHELF TRUCK. All-welded, steel construction. Pipe push handles at both ends. Furnished with 3, 4, or 5 shelves. 12" or 15" space between shelves.

No. 200 GENERAL PURPOSE PLATFORM TRUCK. All-welded, steel construction. Platform available in steel or 1" hardwood stock. Level type wheel mounting. Accommodates a variety of end racks at each end.

No. 900 SEMI-LIVE SKID with KUM-A-LONG JACK. Ideal for receiving, shipping, storage and progressive assembly lines. Provides maximum materials mobility. KUM-A-LONG JACK pivots in a minimum radius. All steel or 1¾" hardwood deck.



TOWSLEY TRUCKS, INC.
1770 ELMORE ST.
CINCINNATI 23, OHIO

Circle No. 147 on Reader Service Card

Circle No. 3 on Reader Service Card for more information

WHEN *George** ROLLS 'EM
HE MAKES HIS POINT

. . . the point being effortless pickup and rolling to destination of heavily laden tote boxes. "George," the almost-automatic truck, is backed up to the box and the hook is inserted into the box handle. Leverage developed by forward pull of truck handle glides the box over beveled edge of truck . . . onto upper set of rollers where it is held safely. Lower set of rollers carries truck away . . . so easily that women can do the job. No dangerous lifting, no strain. Order your "Georges" now . . . for safe, low-cost trucking.

"George"
THE TOTE BOX TRUCK

LET "George" DO IT

*TRADEMARK

2RG55A

Write for free folder F

ROLOCK Inc. • Fairfield, Conn.

the transfer ladles. Total metal now poured ranges from 35,000 to 40,000 pounds in two hours and 20 minutes, as compared with a maximum of 25,000 pounds in about the same time by the old method.

Former methods involved the use of sulky ladles for transfer of metal from cupola to pouring floor and hand ladles for pouring metal into molds.

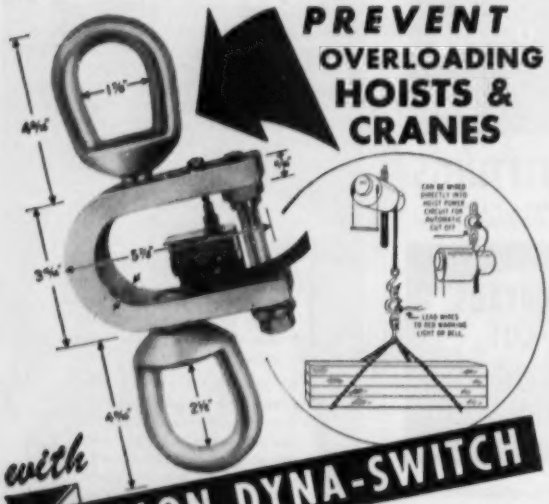
The new crane has also helped to speed up charging the cupola. Installed outside the building, the crane lifts a cone-bottom bucket from the pit up to the level of the charging door, then runs the bucket into the wishbone support in the cupola. The time cycle for a 2000 pound charge has been reduced to four-and-one-half minutes.

• • •

HOW GOODYEAR HANDLES HOSE

Akron, O.—Draining the alcohol from freshly cut hydraulic brake hose created handling difficulties for the Goodyear Tire and Rubber Company, which were

PREVENT
OVERLOADING
HOISTS &
CRANES



with
DILLON DYNA-SWITCH

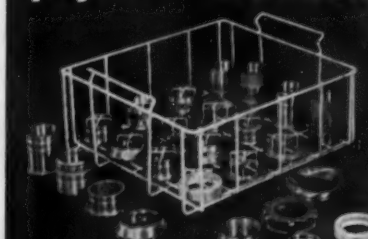
When load limit is exceeded, Dyna-Switch trips a sensitive micro-switch which may be connected to a warning bell or light. If Dyna-Switch is connected into the motor, the overload automatically cuts motor out, and load must be returned to floor and surplus weight removed before pickup can be completed.

Top working range is 20,000 lbs. Set at factory for any desired cutout point, but can also be re-set in the field if working conditions change. Low in cost—always on guard. Write or wire today for illustrated bulletin.

W. C. DILLON & Co., Inc.
14628Q KESWICK STREET • VAN NUYS, CALIFORNIA
(Suburb of Los Angeles)

Circle No. 72 on Reader Service Card for more information

Mid-West Wire
"Carryers"
pay for themselves
every
30
days



When you learn about "Carryers", you'll see why. They're not ordinary wire baskets: as shown, each "Carryer" carefully suspends all parts to protect critical surfaces. "Carryers" become part of your conveyor system throughout processing — including cleaning. The day they go to work for you, they: (1) eliminate scrappage or re-work of parts because of careless handling; (2) eliminate in-transit damage between operations; (3) eliminate parts contamination; (4) eliminate non-productive transfer time before and after cleaning; (5) enable visual inspection, safe, positive stacking; (6) rugged construction for durability. "Carryer" bins also available for bulk-handling of non-critical parts.

this free brochure may help you.

MID-WEST
MID-WEST WIRE PRODUCTS CO., INC.
27 Years of Parts Handling Experience
2559 FENKELL DETROIT 38, MICH.

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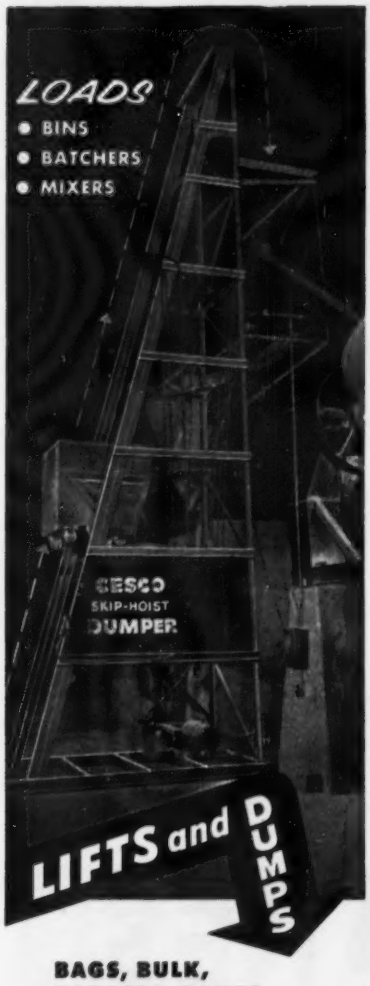
solved by the use of aluminum boxes.

Perforated at the sides to permit easy drying and cooling of the hose, which becomes hot and dripping with alcohol during the cutting operation, the boxes are equipped with handles, attached at either end. Nesting of about 75 percent is possible.

In addition to storing the hydraulic brake hose until the alcohol has drained, Goodyear uses the aluminum boxes for checking quantity of production. Since the aluminum absorbs none of the alcohol and is of constant weight, it is possible to determine the number of pieces of hose produced simply by weighing the loaded containers, subtracting the standard weight of the boxes, and dividing by the known weight of a piece of hose.

Previously, Goodyear drained the hose in cardboard containers, which deteriorated rapidly because of saturation with alcohol, and which, because of changing weight, could not be used to determine the quantity of production.



BAGS, BULK, BARRELS, BOXES MECHANICALLY!

You can save time and money with increased safety by installing a Cesco Skip-Hoist Dumper. Lifts, upends and dumps 100 loads per hour with a lifting capacity range from 100 to 1500 lbs. Single and multi-purpose portable models in standard heights from 6 to 10 ft. Stationary models to 20 ft. Easy, safe operation from push button controls speeds up material handling and eliminates accidents.

Write for complete catalog . . .

ESSEX CONVEYORS, INC.
165 Franklin Avenue, Nutley 10, N. J.

COLSON EQUIPMENT & SUPPLY CO.
1317 Willow Street, Los Angeles 13, California

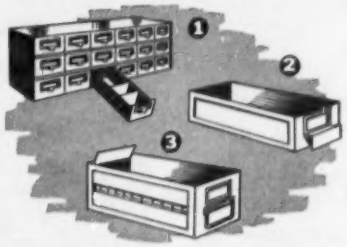
CESCO SKIP-HOIST DUMPERS

Circle No. 86 on Reader Service Card

IMMEDIATE SHIPMENT
★ PRICES . . . Low
★ QUALITY . . . Tops
★ SERVICE . . . The Best

This unbeatable combination makes BAY your best BUY!

BAY SHOP BOXES and SHOP EQUIPMENT



Complete Catalog • Price List on Request
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Philadelphia 32, Pa.

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AS GOOD AS THEY LOOK

ALBION CASTERS

You can depend on Albion Industrial Casters to meet your most exacting requirements for rugged, dependable service for the years to come.

Available in hundreds of types, sizes and capacities . . . a caster for every conceivable type of operation—floor protection or loading requirement.

Then too, Albion casters are more economical. Why not investigate their many advantages and make Albion your one dependable source for better casters.

Albion offers a broader selection of special casters in any size, type or capacity to fit your needs.

Contact your nearest Albion representative or write direct—

ALBION INDUSTRIES, Inc.
ALBION, MICHIGAN

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YOUR BEST *Tip* IN CARTS

No. 119
Sterling
HEAVY-DUTY
CART

If you're looking for a good tip for wheeling coal, scrap, chips, turnings or similar heavy materials, see these Sterling Heavy Duty Carts. Over and over again the "3-Point Landing" feature of this well-balanced cart will convince you it's the best buy for years of service. Can be furnished with pneumatics, as shown, or steel wheels . . . plain or roller bearings. Write for Catalog.

3 SIZES AVAILABLE:

No. 119..... 7½ cu. ft.
No. 120..... 9 cu. ft.
No. 121..... 11¼ cu. ft.

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

A HALF CENTURY OF PROGRESS

Sterling
WHEELBARROWS

Look for this Mark of STERLING Quality

The new boxes have also proved to be handy containers for transporting the hose to the next area of production, since they are light, easy to handle and eliminate the stacking problem which was previously evident.

• • •

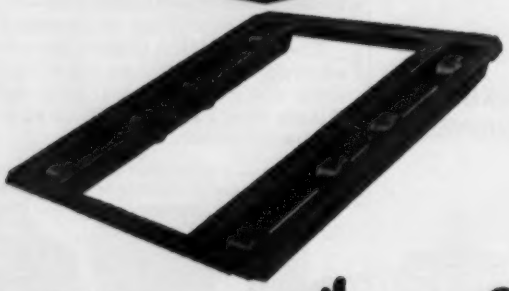
RAPID REFUELING PAYS AT TIMKEN

Canton, O.—A portable fuel tank carried to remote areas where fork lift trucks are working allows the trucks to refuel without returning to distant fuel depots at the huge plant of The Timken Roller Bearing Company.

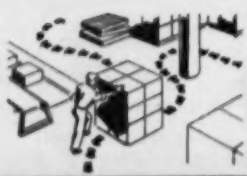
Gasoline or diesel fuel is provided in tanks in accordance with the type of engine used in fork trucks. Motor oil is contained in one small tank and a mixture of water and anti-freeze in the other, thus providing almost a filling-station service.

The tank is fixed to a steel bolster with provisions for confining small cans, all of which can be carried by both straddle carriers and

ACE
SWIVEL KING PALLET ROLLER



ANY OLD DIRECTION *Who cares?*



ACE SWIVEL KING PALLET ROLLERS permit effortless movement of palletized loads in any direction and to any location needed. They speed up material and product movement and remove congestions when fork trucks are not available; eliminate costly delays. Ask for Eng. Bulletin 104K.

FRANK L. ROBINSON COMPANY
Industrial Engineers • Manufacturers • Distributors
LATHAM SQUARE BLDG. OAKLAND 12, CALIF.

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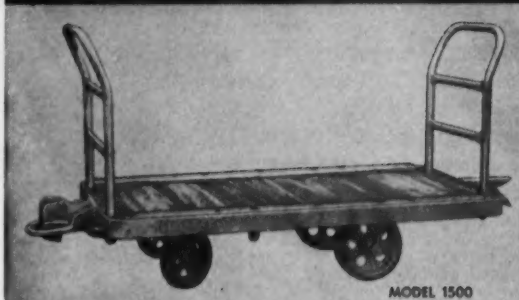
JAKES

America's Finest
Industrial Trucks and Trailers



MODEL 1500

Literature available
Capacities from 2,000 to 10,000 pounds

JAKES FOUNDRY COMPANY
Established 1891
2800 Charlotte Avenue Nashville 9, Tennessee

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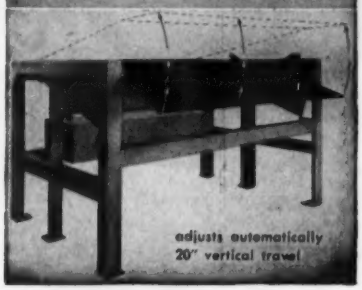
Circle No. 144 on Reader Service Card

Christensen
FLOATING DOCKS



SAVE TIME — LABOR — MONEY

Now it is possible to double your loading and unloading efficiency by installing the new, inexpensive Christensen Floating Dock. Its design provides for up and down counter balance movement to meet varying truck heights. The Self-Contained Unit needs no support and may be placed in front of an existing dock or in a prepared pit. The Basic Unit is recessed into old or new loading platforms and is easy and inexpensive to install.

For complete line data, write
WM. CHRISTENSEN CO., INC.
DEPT. F-54, YORK, PA.

fork trucks. A high-speed straddle carrier transports the tank to work areas, setting it down in a convenient spot. Fork lift trucks low on fuel raise the tank to feed themselves by gravity.

• • •

EQUIPMENT INCREASES DRUG EFFICIENCY

San Francisco, Calif.—An increase of approximately 25 percent in the number of lines handled in the same warehouse, with an increased efficiency of order selection, is reported by the Handyspot Company. The new system utilizes single and doubel deck pallet racks, a high lift platform type walkie fork truck and a mechanical hand lift truck.

Engaged in the business of supplying drug sundries to grocery stores, Handyspot warehouses a multitude of varied orders which must be assembled for immediate spot shipments. The 2500-pound capacity walkie fork truck bears the brunt of the heavy work, stacking in narrow aisles. The hand lift

ASHWORTH PROCESS BELTS

CAN "TAKE" IT, literally and figuratively
Heat resistant . . .
Chemically resistant . . . .
Abrasion resistant . .
Ashworth Metal Belts combine Product Processing and Material Flow

Keep Your Product on the Move

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METAL PRODUCTS DIV. • WORCESTER, MASS.

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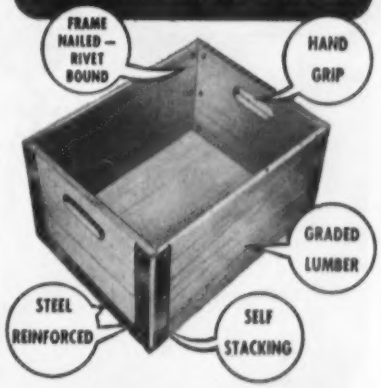
CESCO'S
TOTE-SHOP BOXES
DO YOUR ROUGH/TOUGH JOB EFFICIENTLY • EASILY ECONOMICALLY
on Conveyors • Pallets
Hand Trucks • Skid Platforms
or what have you
RUGGED CONSTRUCTION • PRIME MATERIALS



Model #WB (Wood Bottom)
Stock sizes will accommodate loads up to 200 Lbs., possibly greater, depending upon material packed and handling method.

MODEL WB
STANDARD SIZES AVAILABLE FROM STOCK
(Prices net — F.O.B. Northhampton, Mass.)

Lots of	WB-1	WB-2	WB-3
2000	$1.96	$2.14	$2.28
1000	1.99	2.17	2.31
500	2.02	2.20	2.34
250	2.07	2.25	2.39
100 Min.	2.12	2.30	2.44

Model	Size	Length	Width	Depth	Weight
WB-1	I. D.	14⅞"	11¾"	9"	11¼ lbs.
WB-2	I. D.	18"	11¾"	9"	13 lbs.
WB-3	I. D.	20"	11¾"	9"	14 lbs.

STACK SECURELY, CONVENIENTLY!

Solve your Storage and Handling Problems with our Tote Boxes, Trays and Pallets. Write today for quotations on special sizes. Special Marking Facilities, for identification purposes, are available in various colors and numbers. Please submit detailed specifications.

CESCO CONTAINER CO.
Factory: NORTHAMPTON, MASS.
General Offices:
Dept. (F) 475 Fifth Ave., New York 17, N.Y.

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for short handed plants . . .

a helping hand

A modest crane investment can return important profits — when it's a Conco Crane custom designed to meet your needs. Write for a trained Conco representative to call. His recommendations, like Conco Cranes themselves, are backed by 37 years of engineering experience.

CONCO ENGINEERING WORKS

Division of H. D. Conkey & Company
38 Grove St., Mendota, Illinois

Affiliates
- Conco Engineering Works
- Domestic Heating Equipment
- Conco Building Products, Inc.
- Brick, Tile, Stone

Write for Conco Crane bulletin 3000A

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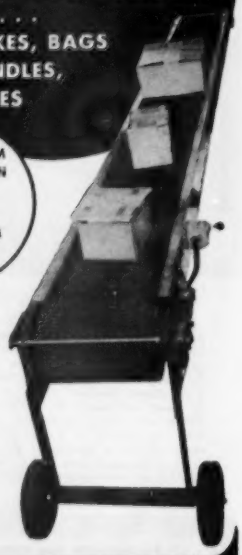
NEW LONDON
"Cost Cutter"
CONVEYORS
Light • Low Cost • Versatile
for . . .
BOXES, BAGS
BUNDLES,
BALES

14' ALUMINUM MODEL SHOWN **$484**
OTHERS FROM **$340**



Electric or gasoline drive. Other flat and trough belt conveyors for inclined or horizontal applications.

Write for Catalog

NEW LONDON ENGINEERING CO.
New London, Dept. F, Wisconsin

NEW!

ENGLER D.C. HOUR LOG
Tells you when your equipment needs servicing

DIRECT READING

Engler D.C. Hour Log protects equipment powered by electric motors or internal combustion engines against haphazard servicing. Indicates hours and minutes of operation. Direct-reading. Sealed, light-weight, durable aluminum case. Easy to install.

Send for Bulletin L 754.

ENGLER INSTRUMENT COMPANY
Instrument Manufacturers Since 1910
259 Culver Ave., Jersey City, N. J.
Hubodometers for mileage
A.C. and D.C. Hour Logs

Applications

- Materials-handling equipment
- Tractors • Pumps • Boats
- Generators • Cranes • Graders
- Industrial Machinery

Installed as original equipment or recommended by leading manufacturers

Airmatic...

THE MODERN MECHANICAL MESSENGER SYSTEM

Airmatic pneumatic tube systems do their jobs so smoothly, so efficiently, so quickly that they don't receive any "fanfare" and "fuss". They're just taken for granted as time, labor and money savers in providing for the transporting of bottles, parts, samples, fragile medical supplies, complete files and IBM cards as well as the traditional uses for transporting papers and money.

There's an AIRMATIC SYSTEM for your need. Contact your local representative or the AIRMATIC home office for further information.

AIRMATIC SYSTEMS, INC.
378 Bergen Blvd., Fairview, N. J.
Phone: Cliffside 6-0475

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Circle No. 178 on Reader Service Card

truck supplements the work of the walkie by spotting specific loads.

• • •

NEW DIGGER SETS RECORD

Coral Gables, Fla.—A phenomenal record of trench excavation through solid coral rock has been established in this city by contractor Morris Prosser, Inc.

Use of four new type pipeline and utility ditches for excavating trench for 300,000 feet of sanitary sewerage lines pushed the sewer job ahead of schedule by more than 100 days.

The newly introduced wheel-type ditcher averaged 1700 feet of trench 24 inches wide and from four to six feet deep each day through the coral rock, technically called "oolite". This performance, coupled with that of three ladder-type ditchers, enabled the contractor to average 3000 feet of trench a day.

Thus the job was completed in less than five months, instead of the originally estimated and hoped for time of 12 to 14 months.

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RENT OR BUY
SILENT HOIST
LIFTRUK
on the
"DAY-BY-DAY EARN-ITS-WAY PLAN"

3-5-7½-10-15 ton CAPACITIES

Exclusive-FLUID DRIVE

If you can reasonably use a Heavy Duty LIFTRUK for at least two hours a day average, to improve the movement of goods in process or reduce materials handling operations, then you should be interested in this unusual "rent-or-pay-as-you-use" plan. Proper cost accounting methods often show that man-hours saved, storage space gained, or time in transit reduced, add up to a profit well above the payments required for LIFTRUK for purchase or rental charges.

For BOX CAR Loading or Unloading Ask for information on New KRANE KAR Model AK8

Write for "Earn-Its-Way" Plan to

SILENT HOIST & CRANE CO.
Pioneers of Heavy Duty Materials Handling Equipment
888 63rd Street, Brooklyn 20, N. Y.

MOVE MORE FOR LESS WITH MICRO LEVER-DOLLIES

Immediate Delivery

Made in Three Handy Sizes

Usually Purchased and Used in Pairs

Reasonable in Price and Guaranteed

Finest Materials and Workmanship.

After First Use You'll Wonder How You Ever Got Along Without Them

Write for complete descriptive circular

MICRON, INC.,
Dept. F
BETTENDORF, IOWA

Rubber Wheels Optional

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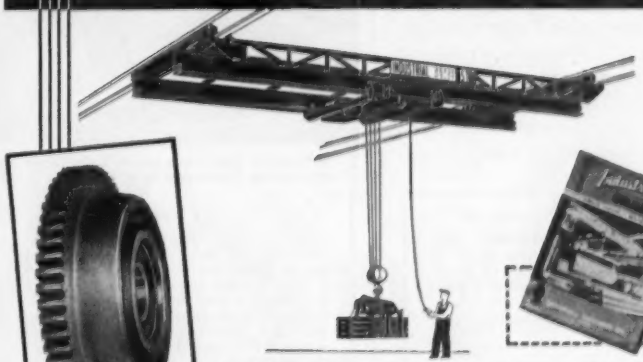
BETTER VALUE
Industrial CRANES
FEATURE
FORGED STEEL WHEELS



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Long lasting forged steel, heat treated, crowned tread wheels are STANDARD equipment on all Industrial underhung cranes. Together with the patented Industrial removable axles these wheels can be changed on the runway in minutes, if ever necessary.

Many other high quality features make Industrial Cranes your best buy in the long run!

Consult with Industrial Crane & Hoist Corp. for information on BETTER VALUE CRANES! FSW 155

Industrial CRANES

INDUSTRIAL CRANE & HOIST CORPORATION
1531 SOUTH PAULINA STREET CHICAGO 8, ILLINOIS
Overhead Cranes • Jib Cranes • Monorail Systems • Crane Runways
Representatives in Principal Cities

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Double your warehouse space

...this easy way with BUTLER pallet racks

In the warehouse pictured above, Butler steel pallet racks hold 96 pallets in space formerly occupied by only 48 floor-stored pallets—and eliminated necessity of moving outside racks to get at inside files. Easy-to-assemble Butler racks are especially effective where you are storing a variety of shapes and sizes of items. Butler materials handling engineers can help you solve special warehousing problems. Mail coupon below today.

For prompt reply, address office nearest you:

BUTLER MANUFACTURING CO.
7370 East 13th St., Kansas City 26, Mo.
970A Sixth Ave. S.E., Minneapolis 14, Minn.
1016 Avenue W, Ensley, Birmingham 8, Ala.
Dept. 70A, Richmond, Calif.

Please mail me more information on Butler Steel pallet racks.

Name_____

Address_____

City_____ State_____

BUTLER

Manufacturers of Oil Equipment
Steel Buildings • Farm Equipment
Dry Cleaners Equipment • Special Products
Factories at:
Kansas City, Mo. • Minneapolis, Minn. • Galesburg, Ill.
Richmond, Calif. • Houston, Texas • Birmingham, Ala.

Circle No. 15 on Reader Service Card

172

A SALTY STORY

Lyon, Kan.—Operating in one of the most severe corrosive conditions found in industry, gasoline fork trucks have no difficulty handling 90 percent of all material handling operations at American Salt Company.

Since fork trucks have been on the job, such products as block salt, bags and cartons of bulk salt are loaded on carriers 75 percent faster. High-stacking has increased storage capacity 100 percent, and man-hours needed for storage operations have been cut 50 percent.

The plant, in the midst of an expansion and modernization program designed to increase production volume, has doubled the volume to date due to a new 750-ton block press and the efficiency of mechanical handling with the fork trucks.

Despite the severity of operating in such corrosive service, company officials report no reduction in efficiency of the trucks or added maintenance expense.

To Break Bottlenecks USE Ferguson Conveyors

A Ferguson 180° Chain Driven Roller Curve Eliminating Bottlenecks In A Bakery.

• You can easily stop jam-ups on production, inspection, packaging and shipping lines. Put FERGUSON CONVEYORS to work moving material where you want it . . . when you want it . . . at the speeds you want, and free personnel for more profitable work.

FERGUSON POWER & GRAVITY CONVEYORS move all sizes, types and weights of material . . . up . . . down . . . sideways . . . around corners. And, they do these jobs economically. That's why users constantly ask for more FERGUSON CONVEYORS.

We'll be glad to engineer the conveyor to suit your job. Write, wire or call for details.

HARRY J. Ferguson COMPANY

121 West Ave. Jenkintown, Pa.
Ogontz 4401

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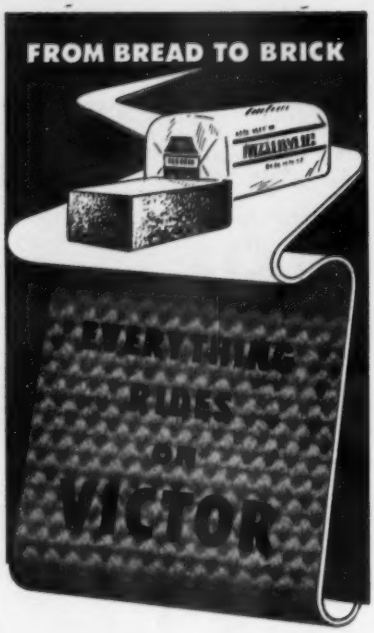
FROM BREAD TO BRICK



Bakers depend on specially engineered Victor conveyor belting for sanitary handling that cannot mar the smooth surfaces of their product. Building supply men know that their specialized Victor belting is tough enough to stand up to the weight and roughness of brick. The answer to your conveyor problem is probably a Victor product, too.

Victor, you see, manufactures the most complete line of textile belting in America. The many Victor engineering belting styles include solid-woven, canvas-stitched, neoprene and balata types in an unmatched range of widths and thicknesses. Standard and special coatings and impregnations adapt untreated belts to hundreds of specialized uses.

One of the hundreds of possible combinations of weave, thickness and treatment may be just the belt you need for your conveyor system. It pays to check with Victor before buying any belting product.

Write today for full information.

3601

Victor Balata & Textile Belting Co.
53 Park Pl., N.Y. 7 • 300 6 W. Hubbard St., Chicago 10
Factory: Easton, Pa.

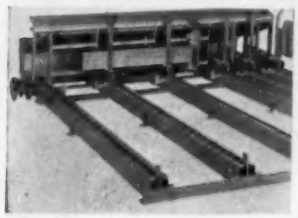
Circle No. 101 on Reader Service Card

NEW EQUIPMENT . . .

(*Continued from page 46*)

Synchronizes Cutting and Handling

Two attachments recently patented by Fried Steel Equipment Mfg. Corp. are said to synchronize cutting and handling and save time and labor by allowing a single operator to handle everything including the shearing operation, movement of the sheet or strip, and discard of trims. The Strip-Stacker receives cut material as it is delivered from the shear bed, stacks it neatly on dollies, then stores it aside. The Scrap Eliminator, by means of a teeter-table, allows the operator to reject scrap at a glance.



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New ¾-Yard Machine Features Interchangeable Parts

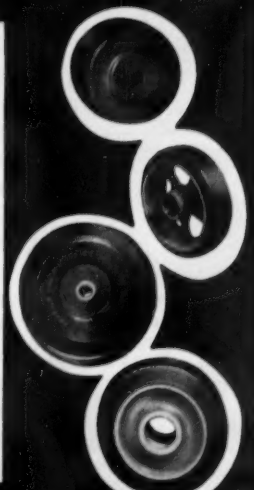
A complete line of full ¾-yard machines has been introduced by Wayne Shovel and Crane Division of American Steel Dredge Company. The

PHOENIX

...Source for Cured-on Solid Tires

For twenty-five years Phoenix has been manufacturing industrial solid tires. Its central location at Joliet, Illinois, assures prompt delivery... and often lower transportation charges for castings.

Modern quality control procedures assure uniformity of tread stock compounds. EXCLUSIVE WITH PHOENIX is the famed "E-Z" Rolling Tread Compound. Also available are special tread compounds, including static conducting, hard rubber and oil-resisting treads!



WRITE FOR FREE BOOKLET indicating sizes and load specifications. Address:

RUBBER PRODUCTS DIVISION

PHOENIX MANUFACTURING CO.

Joliet, Illinois

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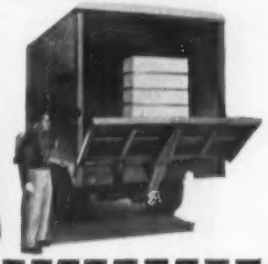
Faster, Safer Deliveries with 50% less cost!

The new St. Paul Hydraulic Frate-Gate — with full power closing — makes it possible for *one man* to load and unload your trucks *faster, more safely than 2 or 3 "muscle-men"*. Use of Frate-Gate cuts labor costs, practically eliminates need for chain hoists, lift trucks, and other special equipment. Unit easily raises 2000 lbs. from ground to truck platform level in seconds . . . sets load down quickly, gently. Handling time is cut in half . . . you make more trips per day, with less danger of injuries to men and cargo.

One double-acting hydraulic cylinder powers all operations . . . lifting, lowering, closing and opening. Heavy-duty lift-arms prevent sagging or distortion, even with off-center loads. Control is made by one of two identical levers, one located at each side of your truck. Operator never has to work on traffic side. Gate stops instant either lever is released. Entire mechanism is mounted *above* axle.

Frate-Gate mounts on any truck — one ton and up — *costs less than 50c a day* to own and operate. Send coupon for more facts *now*. No obligation.

Frate-Gate adjusts to any dock height. Simple, compact design means less weight, less maintenance.



St. Paul HYDRAULIC Frate-Gate

St. Paul HYDRAULIC HOIST

Customer Service Dept. 3614 2 Main St., Wayne, Mich.

☐ Send folder on elevating FRATE-GATE

Name .....

Position .....

Company .....

Address .....

City ..... State .....

SP-FG-4

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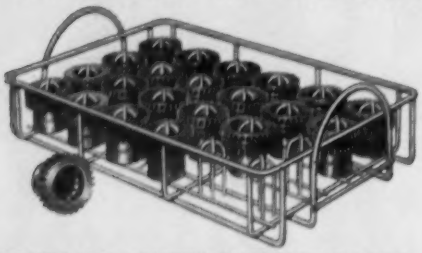
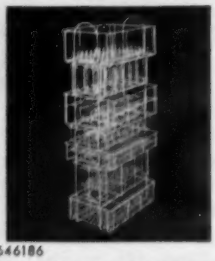
Circle No. 120 on Reader Service Card for more information

EEZY-STAK BASKETS
for Better Parts Handling



EEZY-STAK BASKETS SIMPLIFY PARTS HANDLING...CUT COSTS...REDUCE REJECTS!



WIPCO manufactures a complete line of Custom-Designed stacking (Eezy-Stak) and non-stacking baskets for handling all types of parts through every production and assembly process. WIPCO baskets can be made in any desired size or shape, and from any practical material.

Eezy-Stak baskets feature the exclusive Interlock Handle* which permits easy and safe stacking. Eezy-Staks are available in a wide range of standard sizes and metals which fit most parts-handling requirements. Write today for Bulletin B-54.

*Pat. No. 2646186

WIPCO BASKETS... *FROM INITIAL MACHINING TO FINAL ASSEMBLY AND SHIPPING*

WIRE AND IRON PRODUCTS INC.

1720 SIXTEENTH ST. • DETROIT 16, MICHIGAN

Circle No. 193 on Reader Service Card for more information

MULTITON roller skids
moves machinery & heavy loads
6 TIMES FASTER

- Steers while it moves!
- Unlimited Carrying Capacity
- Self-Laying Track
- Light Weight

another time-money saver...

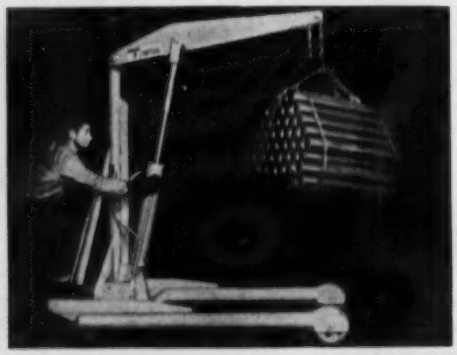
THE MULTITON MOVING WAY!

Man maintains desired direction of travel by steering swivel type Multiton Roller Skid while load is moving. Saves man-hours; reduces down time. Write for Catalog.

STOKVIS EDERA & CO. INC. 18 Secatoag Ave., Dept. B · Port Washington, N. Y.

Anything You Can Hang on a Hook Can Be Easily Handled by a RUGER CRANE

Move heavy, bulky loads easily, quickly — with *one* man and a Ruger Hydraulic Floor Crane. Capacities from ½ to 3 tons.



SUBSTITUTE FOR AN ELEPHANT

RUGER CRANES

601 West Fourth St.
UHRICHSVILLE, OHIO

SEND FOR 1955 CATALOG
Shows the complete Ruger 1955 line of Floor Cranes. Gives full specifications. Truck mounted hydraulic cranes also available. Capacities ½ ton to 2 tons, write now for your copy.

Circle No. 59 on Reader Service Card for more information

MERRILL *MATERIALS HANDLING* DEVICES

MERRILL BROTHERS
56-74 ARNOLD AVENUE MASPETH, N. Y.

Circle No. 27 on Reader Service Card for more information

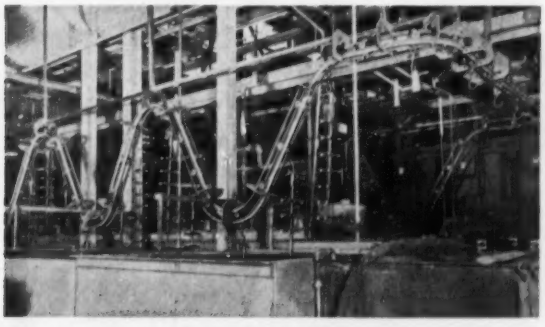
new units are described as custom-made machines at production-line costs. The basic ¾-yard model has been designed to make all major wearing parts interchangeable. Features pointed out include a positive crawler lock and one lever steering control in the crawler model; a 19-foot trench hoe boom which permits a 31-foot 2-inch reach and digging depth of 20-feet 5-inches.

Circle 280 on Reader Service Card for more information

New Floor Lock

Aerol Company, Inc. is manufacturing a caster mounting type floor lock with a full three inches of floor clearance in the retracted position and positive controlled holding pressure. Cast of lightweight, corrosion resistant aluminum, the locks are available in two sizes with an extended mounting height of 7¼ inches or 10¼ inches. A 4¼ inch diameter floor pad with a flexible joint permits adjustment to uneven floors. Weight is approximately five pounds.

Circle 281 on Reader Service Card for more information



Chainless Conveyor Makes Short Turns — up, down, sideways!

"Roller-Coaster" Solves Dip-Tank Operation!

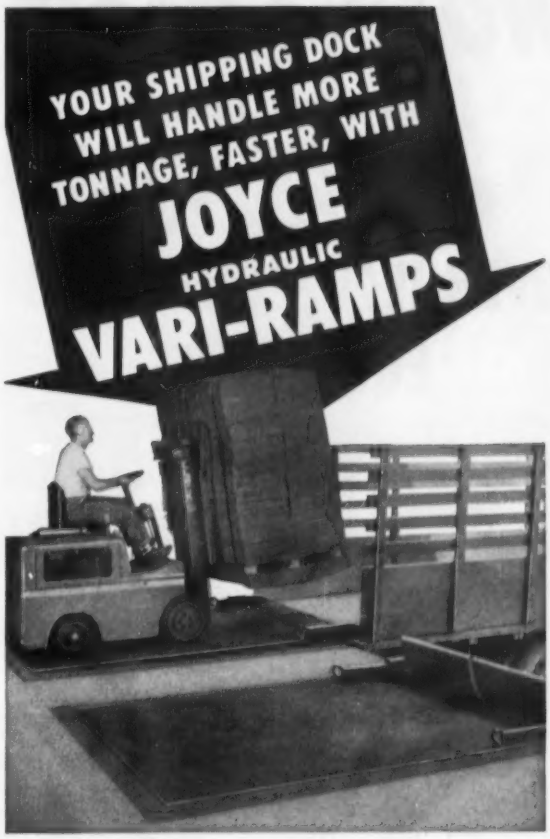
Short-radius "roller-coaster" dips and turns like those above show advantages of Landahl CHAINLESS Conveyors. They permit short-radius turns, horizontally and vertically. No chains or cables to kink, sag, or pile up . . . no excess slack to cause jerky action. Steel-rod connectors pivot at both ends on self-lubricating ball-type universal joints. Unique trolley design is lighter, less bulky, yet meets any practical load-bearing need! **Write for new bulletin 535.**

Recommended for loads up to 100 lbs. per ft.

LANDAHL Chainless CONVEYORS

The LANDAHL CONVEYOR CO., 535 Dennison Ave., Columbus 8, Ohio
A SUBSIDIARY OF THE AMERICAN MONORAIL COMPANY

Circle No. 43 on Reader Service Card for more information



JOYCE Hydraulic Vari-Ramps quickly pay for themselves by enabling shipping departments to handle more tonnage on a given length loading dock, faster, and with fewer men. This is possible because they fit all trucks . . . adjust quickly to the truck bed level . . . and are self-leveling with the truck bed as it varies in height, during loading and unloading.

Joyce Vari-Ramps are available in sizes, capacities, and vertical movements to exactly fit your requirements . . . electric-hydraulic or air-oil operated . . . hand or foot valve, or push button control . . . platforms of all steel, welded construction with non-skid decks.

And when you investigate the price, you will find the initial cost, the installation cost and the operation cost are all on the low side.

The Joyce-Cridland Co. manufactures a complete line of Materialifts, Elevators, Cross-over Bridges, Hydraulic Feed Tables, Factory Truck Lifts and Industrial Jacks.

JOYCE MATERIAL LIFTS

WRITE TODAY FOR COMPLETE INFORMATION

THE JOYCE-CRIDLAND CO.
DAYTON 3, OHIO, U.S.A.

IN CANADA: Midland Foundry & Machine Co., Ltd., Midland, Ontario

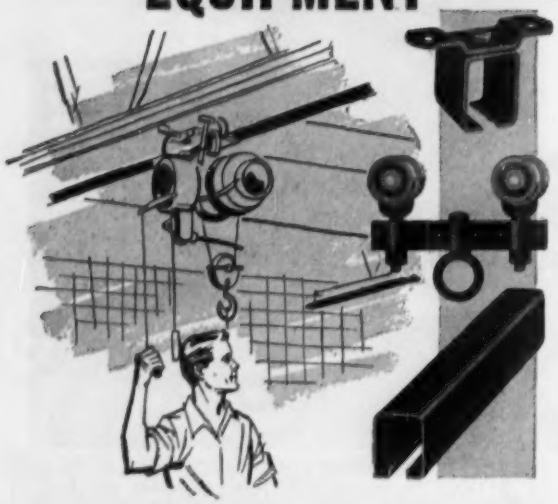
Circle No. 169 on Reader Service Card for more information

NO "Big Deal"

when you install

COBURN

OVERHEAD CONVEYING EQUIPMENT



Your own men can do it . . . and save you money. Here are the simple ABC's of Coburn's easy and inexpensive installation.

A. Our engineers make a study of your particular plant layout.

B. Easy-to-follow plans then are submitted.

C. These plans, plus Coburn's simplicity of parts and design enable your own plant personnel to set up your overhead conveying system quickly and economically.

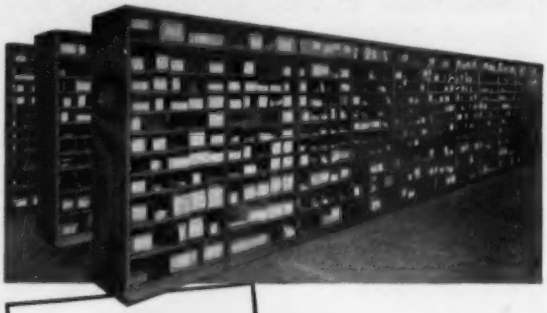
Re-arrangement or extension of your system can be made at any time because of the sectional design of Coburn Overhead Monorail. Coburn Conveying Equipment pays for itself many times over in greater labor efficiency, reduced product damage, and faster handling of materials. Write for Catalog #220 to Coburn Sales and Engineering, 56 Sterling Street, Clinton, Mass.

2578

COBURN PRODUCTS
PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION
CF&I

Circle No. 99 on Reader Service Card for more information

Circle No. 146 on Reader Service Card for more information



FREE

LAYOUT SERVICE for all storage needs

Trained Equipto engineers will lay out your storage facilities . . . suggest the number and types of units you will need . . . assure maximum use of every inch of floor space . . . increase working efficiency by expert arrangement of units. Take advantage of this free service. Ask our engineer to call, or write for catalog on complete line.

Equipto DIVISION OF AURORA EQUIPMENT CO.

805 Prairie Ave., Aurora, Illinois
Steel Shelving . . . Parts Bins . . . Drawer Units

See **Metzgar** before you buy

Conveyor systems to your specifications can be fabricated from standard and modified units at substantial savings.

Our engineers are familiar with the best accepted practices in your industry. Ask us to recommend a practical installation that will help you meet the lower costs of your "conveyorized" competition. There is no obligation.

METZGAR CONVEYOR CO.

423 Douglas St., N.W.

MFRS. OF WHEEL & ROLLER GRAVITY & LIVE ROLLER CONVEYORS • POWER BELT CONVEYORS • SWITCHES • ACCESSORIES & REEL DOLLIES

GRAND RAPIDS 4, MICH.

Circle No. 8 on Reader Service Card for more information

Small Stand-Up Fork Truck

A new stand-up fork truck with all the function of the Load-Mobile sit-down type is being manufactured by Market Forge Company. Electrically operated, the truck has two speeds forward and two speeds reverse and deadman brake control. The direction lever is hand operated and mounted conveniently near the steering wheel. The truck's turning radius is 52 inches. Features pointed out are versatility, ease of operation, lightweight, long-life and ruggedness.

Circle 282 on Reader Service Card for more information

Easily Assembled Shelving

A line of steel shelving with more than 1000 different combinations has been announced by Standard Pressed Steel Company. The shelves, which are said to be easily assembled, are available in 35 different sizes, from 25 inches by nine inches to 48 inches by 36 inches. They are of 18-gauge steel.

Circle 283 on Reader Service Card for more information

ROLLAWAY SEMI-LIVE SKIDS AND JACKS

FEATURING THE RE-NU TOP

Steelbound Rollaway Skids combine the best features of bolted and welded designs. The frame supporting members are arc-welded, and the renewable hardwood deck is tightly clamped with steel bolts of extra tensile strength. Welded-in, heat-treated, steel connecting pin. Semi-steel rubber-tired or Flor-Savr wheels with Hyatt roller-bearings, heat-treated steel axles.

CAPACITIES: 1500, 2500, and 5000 POUNDS

YALE AND TOWNE ROLLAWAY JACKS are stocked at the Lanham Company's plant and are sold and shipped directly from Keokuk for use with ROLLAWAY SKIDS.

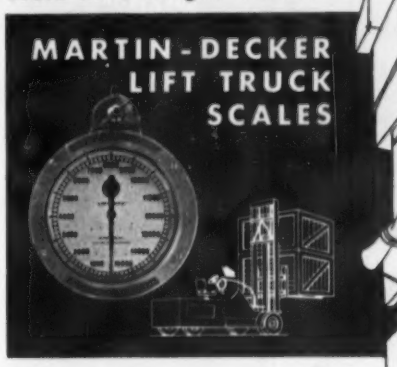
LANHAM SKID CO.

DIVISION OF THOMAS TRUCK & CASTER CO.

586 On the Mississippi River, Keokuk, Iowa

Circle No. 58 on Reader Service Card for more information

One fine could have bought several



Weigh it! *as you lift it*

This inexpensive device shows the driver the exact weight picked up thus assuring a full load with safety. It can be used to totalize loads and check records of stock and inter-plant storage. Permits floor weight distribution. Prevents elevator overloads. Safeguards equipment and life.

Fits any hydraulic cylinder type lift truck

After the simple installation your fork-lift truck becomes a scale that automatically weighs every load lifted, constantly reminding your operator of safety limits and saving him many time-consuming trips to stationary scales.

For further information mail coupon to Martin-Decker Corp., 3431 Cherry Ave., Long Beach 7, Calif.

☐ Please send literature on Martin-Decker Lift Truck Scale.
☐ Have local representative call for an appointment.

DEPT. N-5

NAME _____

TITLE _____

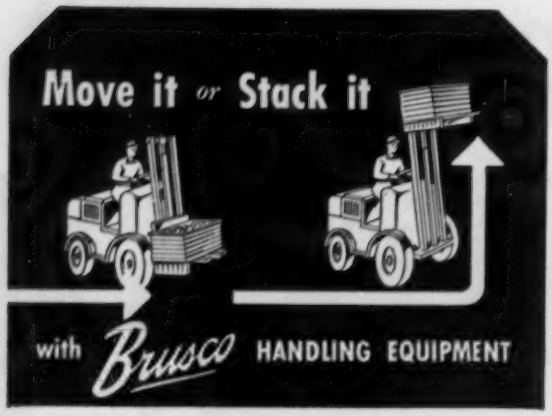
COMPANY _____

CITY _____ STATE _____

MARTIN·DECKER CORP.

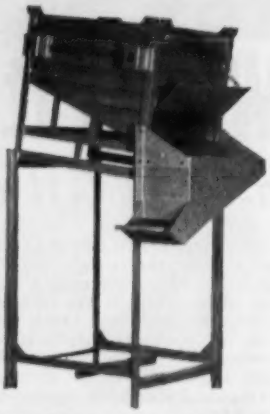
HOME OF THE WEIGHT INDICATOR — LONG BEACH, CALIFORNIA

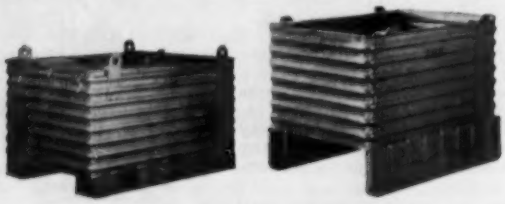
Circle No. 159 on Reader Service Card for more information



No. H591 BRUSCO Slope Bottom Parts Box

With Lift Door, Combination Stand and Discharge Hopper. Engineered to let gravity bring parts down to correct working height. There are no work interruptions or parts "jam up" where this BRUSCO Unit is working for you. Hopper is interchangeable for right or left flow of material. Send for the descriptive, complete line BRUSCO Bulletin and name of your local representative.





No. 558 No. 559

BRUSCO Corrugated Skid Boxes

Also manufacturers of:

BOXES - SKIDS - PALLETS - RACKS

BRUSCO self dumping hoppers

When requesting price information, please give dimensions, load capacities and quantities.

Brusco HANDLING EQUIPMENT

BRUMMELER STEEL PRODUCTS CORP.
1410 Ionia Ave., S. W., Grand Rapids, Mich.

Circle No. 162 on Reader Service Card for more information

Circle No. 179 on Reader Service Card for more information

MAKE YOUR OWN CRANE...

...at a NEW LOW COST!

Handle loads up to 2000 lbs., SAFELY,

easily... Buy crane beam locally — we furnish the rest... A pair of self-aligning, ball bearing Flexo-Crane trucks cost only..... $119.00
Simple instructions come with shipment.

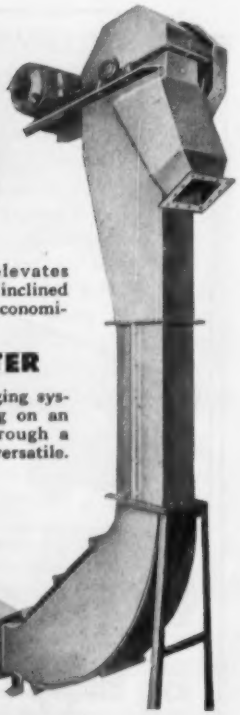
Complete Flexo-Crane, with hoist and accessories, is also economically priced. To get full details, ask for —

BULLETIN F-128

The Abell-Howe Line includes a wide range of overhead cranes monorails, hoists and accessories.

ABELL-HOWE COMPANY 53 W. JACKSON BLVD. CHICAGO 4, ILL.

for bulk MATERIALS HANDLING



One unit feeds, conveys, elevates through horizontal, vertical or inclined planes... quickly, efficiently, economically. It's the...

G-W FLOWMASTER

...a self-loading, self-discharging system of steel flights... moving on an endless all-steel chain... through a dust-tight casing. Unusually versatile. Write today.

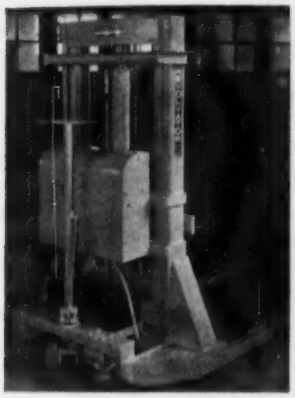
GIFFORD-WOOD CO.

HUDSON, N. Y. AND PRINCIPAL CITIES

Circle No. 11 on Reader Service Card for more information

Heavy-Duty Portable Elevator

A heavy-duty fork lift straddle type portable elevator is available from Revolvator Company. Moved manually from point to point, the carriage has an electric lift powered by two standard six-volt automotive type storage batteries. The mast telescopes to 68 inches and the forks lift from a lowered height of 2½ inches to 85 inches above the floor. The straddle base arm construction, designed to straddle a 42 inch wide by 48 inch long pallet, eliminates the necessity for counterweights. Capacity is 2000 pounds.



Circle 284 on Reader Service Card for more information

Self-Sweeping Paint Striper

A self-sweeping Mark-A-Zone paint striping machine is available from S. B. Beugler Company. The new device removes interfering objects just ahead of the paint stripe. A spreader removes

CAN YOU THINK OF A BETTER WAY TO HANDLE MATERIALS?

CONVOY'S CHEMBOARD* SELF-STACKING TOTE BOXES *MAY BE YOUR ANSWER*

Convoy Boxes are LOW COST, STRONG and LIGHT WEIGHT . . . are made in a wide range of stock sizes and shapes. They weigh and cost less than 40% of steel.

*Chem-Board is Convoy's chemically impregnated corrugated board . . . flint-hard, rock-strong.

Here's an example of Convoy Self-Stacking Boxes speeding production, conserving space, saving money.

GET IN TOUCH WITH

CONVOY, INC.

CANTON 6, OHIO

P. O. Station B, Box 216-F

STANDARD AND CUSTOM-MADE NESTING, STACKING, and VERTICAL-SIDED CHEM-BOARD TOTE BOXES

Circle No. 136 on Reader Service Card for more information

Streamline YOUR Small Parts Handling System . . .

with NESTIER

the pre-engineered materials handling containers designed for use throughout the plant . . . . .

Eliminate costly rehandling . . . increase production efficiency . . . reduce loss and damage . . . with NesTier materials handling equipment. This complete line of specially-designed and standardized boxes, baskets and integrated equipment gives you the most efficient system available today for handling small and medium size parts.

With a pre-engineered NesTier system, you can solve basic problems in all types of parts handling operations. NesTier boxes and baskets eliminate rehandling from one container to another . . . can be used from receiving through production to stores and shipping. Manufactured to close tolerances, these versatile units also permit batch-weighing for production or inventory control. In addition, NesTiers can be used for temporary or permanent storage applications without the use of shelving.

For the Complete NesTier Story, Write Today for Your Free Copy of New Catalog DN-1000.

C-199-DN

NESTIER ®

. . First in small parts handling

The Chas. Wm. Doepke Mfg. Co., Inc.

8836 BLUE ASH ROAD • ROSSMOYNE, OHIO

Circle No. 23 on Reader Service Card for more information

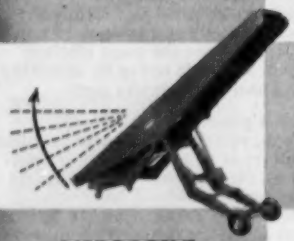
You CAN work both ends from the middle with the NEW SPEEDLIFT...

Speedways new versatile — portable power belt conveyor

THERE'S no trick to working both ends from the middle with this NEW SPEEDLIFT Portable Power Belt Conveyor. It's designed to do this amazing job . . . and more! And most important it is low-priced, keeping initial costs down and enabling you to continue to shave costs all along the line — and we mean assembly line, production line, and materials handling line!

SPEEDLIFT works everywhere — as loader and unloader for trucks and railroad cars; as a stacker or conveyor line booster; or as an assembly line unit.

LIGHTWEIGHT
— one man can move, adjust, set it up or store it.



ADAPTABLE
— can be used in any position from horizontal to 30° incline.

VERSATILE
— either end elevates, or it can be used in horizontal position from just 22" off the floor to maximum of over 5 feet!

You'll give a new lift to your materials handling problems . . . to car-to-car, platform-to-platform loading and conveyor line installations with SPEEDLIFT. Learn how versatile . . . yet amazingly inexpensive it is. Write today for new product literature — Bulletin F-11.

IMPORTANT! Material Handling Distributors:
Certain exclusive territories for distribution of the complete Speedways Line are open. Write for details.

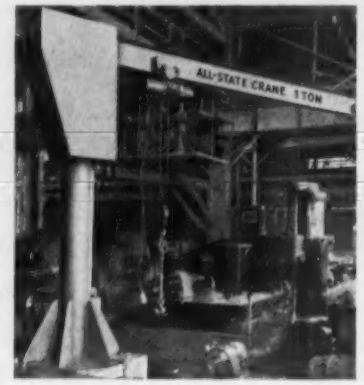
SPEEDWAYS CONVEYORS, INC.
202-208 Rhode Island Street, Buffalo 13, N. Y.
IN CANADA
Speedways Conveyors Ltd. 61 Walnut Street Fort Erie, Ontario

Circle No. 54 on Reader Service Card for more information

Circle No. 165 on Reader Service Card for more information

GUARANTEED GAINS WITH ALL-STATE CRANES

JIB CRANES $215.00 and up



JIB CRANES $215.00 and up

DURABLE DEPENDABLE ECONOMICAL

OVERHEAD—GANTRY—JIB CRANES
AND RUNWAY SYSTEMS

ENGINEERED TO MEET YOUR REQUIREMENTS

Complete Information On Request

ALL-STATE ENGINEERING CO.
4425 West State Street • Milwaukee 8, Wis.

National Biscuit Co.'s Philadelphia Distribution Depot showing two 60 Unit, 5 Step Denominators.

NABISCO **uses The DENOMINATOR to analyze National Sales!**

How many Ritz Crackers, Premium Saltine Crackers, Fig Newtons Cakes, etc., were sold by National Biscuit Co. today? To answer the question accurately, tabulating clerks in each district office—working from agency sales sheets—quickly and easily record the units sold on The DENOMINATOR by kind or type.

Daily totals are subsequently recapped into weekly and monthly summaries for review by Management.

What's your counting-sorting problem? For further details and literature write Dept. FM-52.

The DENOMINATOR COMPANY, Inc.
261 BROADWAY, NEW YORK 7, N. Y.
Manufacturers of Tabulating Machines for 40 years

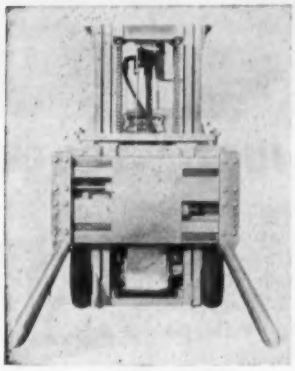
Circle No. 158 on Reader Service Card for more information

excess film from beads when striping with beaded paint. The spreader head, available in widths from two to five inches, feeds paint automatically when contact with surface is made and shuts off when raised. It does not drip when moved from one position to another.

Circle 285 on Reader Service Card for more information

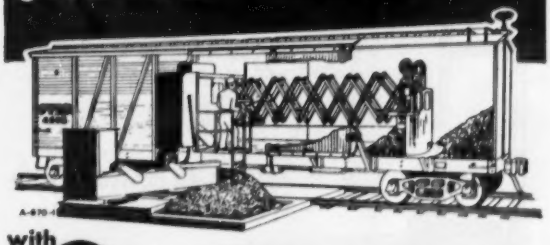
Squeeze Clamp Attachment

Marketing of a new type squeeze clamp attachment for its stand-up and sit-down fork lift trucks has been announced by Lamson Mobilift Corporation. The attachment is similar to a standard squeeze clamp, but with special round forks 33 inches long and egg-shaped on the ends. The forks will close up to a minimum of approximately 18 inches and open up to a maximum of 55 inches. The attachment was designed for handling rolls of textile materials that are stacked flat in a trailer or in a warehouse, and can also be used for other similar types of materials.



Circle 286 on Reader Service Card for more information

UNLOAD BOX CARS IN ONE-HALF MAN HOUR



with S-A BOX CAR UNLOADERS

This new Box-Car Unloader, with its Automatic power scoop, will unload almost any pulverized, granular or small lump material, normally transported in box cars . . . faster, easier and safer. Eliminates operator exposure to dust and accidents. Original and operating costs and the space required are much less than for Rotary or Tilting car dumps.

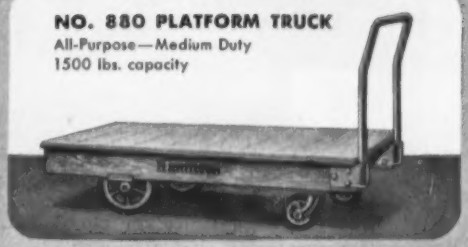
WRITE TODAY FOR COMPLETE INFORMATION!

STANDARD PRODUCTS DIVISION
STEPHENS-ADAMSON MFG. CO.
36 Ridgeway Ave. Aurora, Illinois

Circle No. 123 on Reader Service Card for more information

THERE'S A HAMILTON TRUCK just right for you!

NO. 880 PLATFORM TRUCK
All-Purpose—Medium Duty
1500 lbs. capacity



ROLL-N-STOR SKID TRUCKS
Regular or Heavy-Duty
1250-2500 lbs. capacity

LITE-N-TUFF HAND TRUCKS
4 models—400 lbs. capacity

HAMILTON'S COMPLETE LINE OF INDUSTRIAL TRUCKS WILL MEET ALL YOUR REQUIREMENTS!

Whether the application is routine or highly specialized, you're sure to find a Hamilton truck that's exactly right for the job! Ranging in load capacity up to 10,000 lbs., Hamilton trucks are available in hundreds of styles and sizes—platform trucks, two-wheel hand trucks, box trucks, stake trucks, shelf trucks, wagon trucks, lift truck systems, skid platforms, dollies, and many others.

Hamilton has been one of America's leading producers of floor trucks, casters and wheels for more than half a century. This manufacturing know-how is your assurance of rugged, dependable service when you specify Hamilton equipment! Tell us your requirements—we'll supply Hamilton trucks that are job-engineered and job-built to meet them! Send for complete information today!

COMPLETE CATALOG FOR YOUR FILES!
The Hamilton Caster & Mfg. Co.
1672 Dixie Highway, Hamilton, Ohio
Please Send Me a Hamilton Floor Truck Catalog!

NAME _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

Circle No. 110 on Reader Service Card for more information

BEAT the HIGH COST of LIFTING

with efficient time-saving...

Hi-Speed job-fitted

BAUGHMAN CONVEYING EQUIPMENT

MODEL 225

Conveyor Combinations assembled from standardized sections. Quickly "job-fitted" to any bulk material handling problem. Prompt delivery from stock. Bulletin A-342.

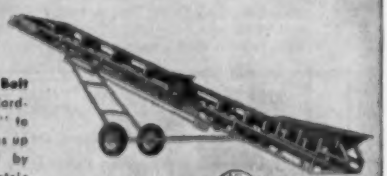
MODEL Q-S1

Hi-Speed Screw Conveyor for material that rolls or becomes fluid in motion. Permanent installations or portable models as above. Underbin and undertrack screw loaders easily attached. Write for Bulletin A-295.

MODEL 175

Belt and Bucket Elevator. Fully enclosed buckets, centrifugal discharge elevator for permanent or temporary installations. Also open belt and bucket models, 210 and 220 available. Write for Bulletin A-299.

MODEL 230



Portable Troughed Belt Conveyor . . . standardized and "job-fitted" to your needs. In lengths up to 46 ft. Powered by gasoline or electric motor. Write for Bulletin A-296.

BAUGHMAN

BAUGHMAN Mfg. Co., Inc.
106 Arch St. Jerseyville, Ill.

Circle No. 176 on Reader Service Card for more information

Circle No. 161 on Reader Service Card for more information

ROWE ADJUST-A-TRUCK

■ If you can't adjust your dock level, because of space limitations, you can use the Rowe ADJUST-A-TRUCK which is set into the pavement in front of the dock. By means of a heavy-duty electric hydraulic system, it adjusts each vehicle to required dock height. Capacity: 40,000 lbs.

Write for free, illustrated brochure. It's brand new.

ROWE METHODS, INC.
2534-C DETROIT AVENUE • CLEVELAND 13, OHIO

LOW COST, RUGGED Hydraulic SKID TRUCKS

for loads up to 1000 lbs!

- ★ HYDRAULIC RAISING & LOWERING
- ★ PUSHES OR PULLS
- ★ FLOOR PROTECTIVE WHEELS
- ★ ALL STEEL WELDED CHASSIS
- ★ LIGHT WEIGHT
- ★ COVERED STEEL PLATFORM USED AS PLATFORM TRUCK

● Fully illustrated bulletin HST-19 describes this versatile truck in detail. Write for it today. Catalog GP-17 describing many standard Ironbound cost-saving units will be sent you without obligation, too.

IRONBOUND BOX & LUMBER COMPANY
30 Hoffman Place, Hillside, New Jersey

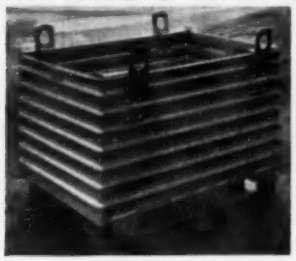
Ironbound — **IRONBOUND**

MANUFACTURERS OF QUALITY BUILT SKIDS, SEMI-LIVE SKIDS, FLOOR TRUCKS, SKID TRUCKS, ROLL TRUCKS, DOLLIES AND PRY BARS

Circle No. 66 on Reader Service Card for more information

For Hot Forgings

A new tierable fork roll-over box that handles red hot forgings without warping has been developed by The Union Metal Manufacturing Co. The heat-resistant, corrugated box is made from seven gauge, low-alloy, high-tensile, hot-rolled steel of deep drawing quality. Box sides and bottom are perforated with 100 one-inch ventilating holes for uniform heat dissipation. The special boxes are used primarily to handle forgings as they come out of hammers at temperatures in excess of 2000 degrees.



Circle 287 on Reader Service Card for more information

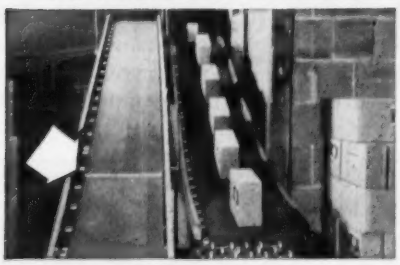
Smaller Belts, Greater Loads

A new line of Compass transmission belts has been placed on the market by Goodyear Tire and Rubber Company. Incorporating the Goodyear patented 3-T cord process, the new development makes possible handling of greater loads with smaller belts. The new belt is said to be thinner and more flexible and greatly improved in all-around performance.

Circle 288 on Reader Service Card for more information

ALLIGATOR®

CONVEYOR BELT LACING



*Every Tooth A Vise**

in Long Continuous Lengths for Conveyor Belts . . . . .

- ★ Excellent for Package Conveyors, Portable Loaders, Trenching and Ditching Machines, etc.
- ★ In canneries where corrosion or rust is a problem specify Alligator made of Stainless or Monel.
- ★ For magnetic separators or anti-sparking specify Alligator made of Everdur.
- ★ Separable and smooth on both sides.
- ★ 12 sizes. For belts from 1/16" to 5/8" thick—and *any width.*

Order from Your Supply House. Ask for Bulletin A-60.

FLEXIBLE STEEL LACING CO. 4702 Lexington St., Chicago 44, Ill.

JUST A HAMMER TO APPLY IT

Circle No. 103 on Reader Service Card for more information

Phillips INDUSTRIAL TRAILERS

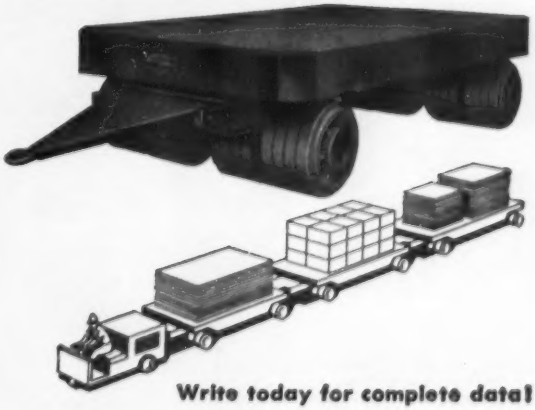
✓ FOR HAULING ALL KINDS OF INDUSTRIAL PRODUCTS—MATERIALS

✓ MADE IN SIZES AND CAPACITIES TO MEET YOUR NEED

✓ FEATURE TIMKEN BEARINGS
PNEUMATIC OR SOLID TIRES
ALL STEEL WELDED CONSTRUCTION

MODEL TF-50
2½ Ton Capacity

MODEL TD-400
20 Ton Capacity



Write today for complete data!

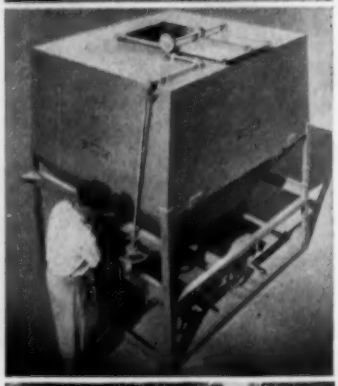
Phillips
CORPORATION
(formerly Phillips Mine & Mill Supply Co.)
Manufacturers Since 1863
15 Arch Street, Carnegie, Pa.

Circle No. 130 on Reader Service Card for more information

Briefly, this ad illustrates why DEMPSTER-DUMPSTER SYSTEM

Container at right has cast iron bottom and inside walls are lined with fire brick. It handles hot skim off aluminum.

This Tilt Type Container was the result of a cost-cutting idea whereby a high temperature dusty product would be handled by a plant's Dempster-Dumpster. Container has cooling fins, counter-balanced hinged lid with 3-way locking device, 16" sliding gate valve and two sight-glass inspection openings.



Here is a Hopper Type Container with a top door for filling and two bottom discharge doors operated by rack and pinion. Another case where the Dempster-Dumpster System was applied to an additional problem to further reduce costs.

Container at right is just one of several different types we have designed to handle equipment, materials, packages, parcels, etc.

IN A NORMAL INSTALLATION the Dempster-Dumpster System is purchased by a plant because of its proved record for handling bulk materials at tremendous savings. This normal installation usually includes one truck mounted Dempster-Dumpster and any number of standard containers designed to meet the various requirements within the plant. In some cases, containers number 40 to 50. These containers can range in capacity up to 21 cu. yds., with all containers served by the one Dempster-Dumpster.

In the great majority of cases this basic installation is just a starter. Management men, constantly looking for lower operating costs, find numerous and amazing extra savings in the Dempster-Dumpster System. Once in service, transporting developments of every description come to light that supplement the original functions of the equipment. Your own men find easier, quicker and additional cost saving ideas for its use. Many even overshadow the original savings and the equipment becomes more and more indispensable.

Look over just a few of the "Special" containers illustrated in this ad. They are all the result of rough ideas that originated with the men in plants after a basic installation, then developed by our engineers. All ideas were stimulated by the powerful Dempster-Dumpster and its flexibility in picking up, hauling, setting down or dumping anything that needs transporting, at lower cost.

One man, the driver, and a few simple hydraulic controls in the cab of a Dempster-Dumpster, will become indispensable in your plant. It is just that in hundreds of plants of every description throughout the nation. Let one of our representatives give you details of installations. Manufactured exclusively by Dempster Brothers, Inc.

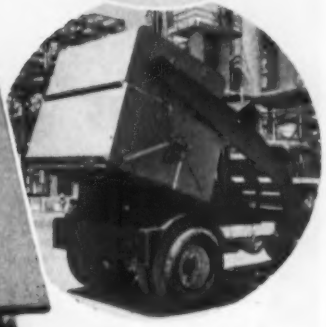
Above container is built with cast iron liner. The holes in outer wall are for cooling.

Here is one of several special drop bottom type containers equipped with couplers and ball bearing trucks for operation in train on rails.

THE DEMPSTER DUMPSTER SYSTEM

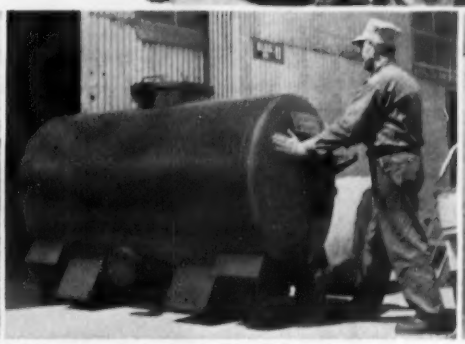
DEMPSTER BROTHERS

so many plants find the indispensable...

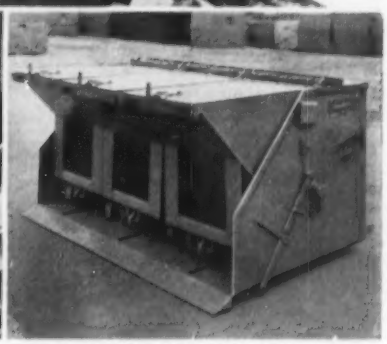


Two photos above show how all containers, regardless of design, are picked up and hauled. At destination materials are dumped from drop bottom containers as shown at left . . . from Tilt and Skip Type Containers by tilting. Any load, of course, may be set down intact.

This is a special adaptation whereby waste zinc slurry is pumped into two containers, which serve as settling tanks, enabling majority of the water to be decanted before sludge is transported and dumped at waste basin.



Tank Type Containers are available with or without casters in steel, aluminum, stainless steel, etc. Capacity ranges up to 1,200 gal. They may be lined with rubber, lead, highly resistance coatings, etc.



This is a master container with three 2 cu. yd. insert containers. Each insert container is provided with casters, counter-balanced spring-hinged lid for loading and dumping.

635 Shea Bldg., Knoxville 17, Tenn.

Circle No. 55 on Reader Service Card

BOWERS

BATTERIES

Always Better

BOWERS BATTERY & SPARK PLUG CO., READING, PA.

CLASSIFIED ADVERTISING SECTION

HELP WANTED

EXPERIENCED CONVEYOR SALES ENGINEER for metropolitan New York. Full line of conveyors. Salary and commission. Our employees know of this ad. Write, c/o FLOW, Box 3155.

Estimator with package conveyor or power transmission, light structural and sheet metal experience. Good opportunity with growing Chicago concern. Answer fully, stating age, experience, salary requirement. Write c/o FLOW Box 3255.

Substantially rated manufacturer of traveling cranes, jib cranes, monorail equipment, etc., wants aggressive representation in Eastern, Southern and some Mid-Western territories. If you are prepared to give active attention to a complete and competitive line, write c/o FLOW, Box 3355.

MATERIALS HANDLING SALESMAN:

Additional man for expanding front line distributor and erector of nationally advertised cranes, hoists, monorails, overhead conveyors and related equipment; exclusively and semi-exclusively sold in Metropolitan, New York and Long Island areas. Guaranteed base salary commensurate with ability, plus commission, sales and auto expenses. Send resume, indicate highest earnings. Write c/o FLOW, Box 3455.

FOR SALE

2—Mono-Rail Conveyor Systems for towing platform trucks; in good operating condition:

1—1833 ft. long.

1—2060 ft. long.

Each has three 20 hp, 208 V, 3-phase, 60-cycle motors. For further information write: W. L. Serenbetz, Chief Engineer, Railway Express Agency, 219 E. 42 St., New York 21, N. Y.

ELECTRIC FORK TRUCKS

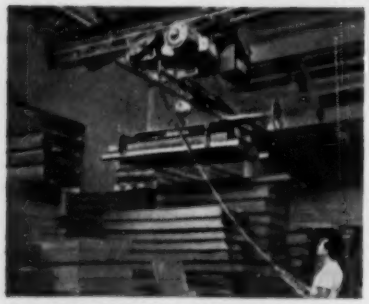
Two Clark and Two Yale Electric. Only one year old. Complete with Batteries and Chargers. 2000 lbs. capacity —24" centers. Guaranteed perfect. These trucks are for the discriminating buyer who would normally buy new equipment but is interested in saving 33-1/3%.

Clark-Hopkins Equipment Corp.
Montgomery, Pa.
Phone: North Wales 4401

7500 STEEL LYONS MANUFACTURING CO. CARRIER FRAMES with wooden floors. 20-⅛" x 30-⅛"; 3-¾" high. Excellent condition.

ACME IRON & METAL CO.
15725 Saranac Road, Cleveland 10, Ohio. Phone: MUlberry 1-4787

MANSAVER GRABS® Sheet Grabs for All Conditions

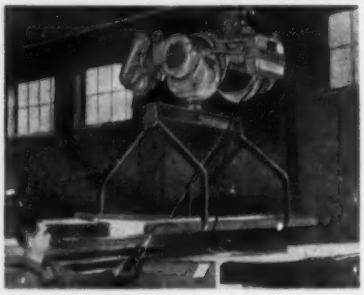


Showing how high and neatly sheets can be stacked with a Mansaver

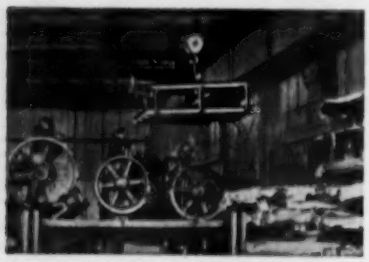
OUR ENGINEERS ARE AT YOUR SERVICE

If you can't use a sheet grab, perhaps you can use one of our 500 other styles

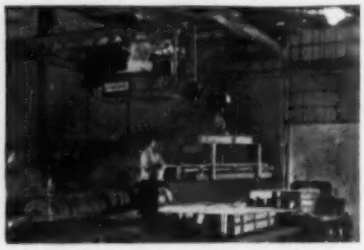
COMPLETE CATALOG ON REQUEST



Operating with trolley hoist all under one-man control



How a Mansaver takes sheets direct from storage to the presses



Fully loaded truck and trailer unloaded in 20 minutes with motor-driven grab!

★ MANSAVER INDUSTRIES, INC. • 3103 EAST ST., NEW HAVEN, CONN. ★

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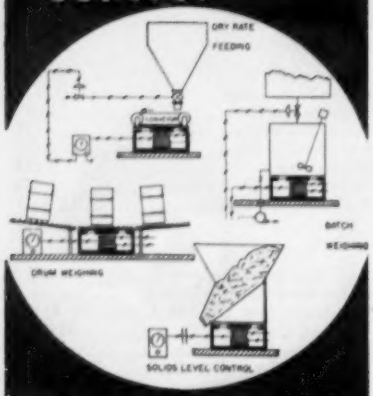
a NEW tool for process control



W/C Weighing Scale

PNEUMATIC-PLATFORM TYPE

- For batch or continuous weighing of solids or liquids
- For remote indication or continuous flow control
- With accuracy above 0.25% of range
- Highly sensitive, extremely rugged
- No springs, knife edges, or levers
- Unaffected by off-center loading on platform
- Unaffected by vibration

Here's the latest step toward continuous process control of your plant —especially in explosive or dusty atmospheres. It's the new W/C Weighing Scale . . . fully tested, proved, and guaranteed to cut processing time or improve your yield.

Based on the force-balance principle, the W/C Weighing Scale translates weight into a pneumatic output signal. It is furnished complete with a remote panel containing a weight indicating scale 45 inches long.

Available in ranges up to 5000 pounds, it is the first device that reliably uses weight as a criterion of measurement to meet the demands of modern process control.

WRITE FOR Catalog which gives complete details, engineering drawings, and calibration curves.

WEIGHING COMPONENTS, INC.

64-6 PULMOR AVE. • Hatboro, Pa.

Circle No. 2 on Reader Service Card

New Development In Wire Rope

Wire rope claimed to have 15 percent greater strength than the strongest grade previously marketed have been developed by John A. Roebling's Sons Corporation. In the past, one of the obstacles to rope of higher strength was a proportionate decrease in other qualities as the strength went up. The new rope, with steel cores, is said to have higher resistance to wear from bending and abrasion. There has been no increase in rope size, but the life of the rope has been doubled. Manufactured primarily in preformed constructions, the higher strength rope may be obtained in sizes ranging from ¼-inch to 3½-inches.

Circle 278 on Reader Service Card for more information

UNITABLE®

BELT CONVEYOR

For Assembly - Inspection - Packaging

The most ADAPTABLE portable conveyor you can find. Exclusive unitized design 10' to 80' lengths. Write for UNITABLE Bulletin now.

CONVEYOR SPECIALTY COMPANY INC.

36 Newport Avenue
North Quincy 71, Mass.

Circle No. 78 on Reader Service Card for more information

If it's a Magliner, you can be sure it's the *right* dock board because Magliners are engineered specifically for your dock conditions . . . your equipment and loads . . . and your operational requirements. Because they meet difficult and out-of-the-ordinary conditions, Magliner magnesium dock boards eliminate costly bottlenecks—and make loading costs go down. Dock traffic moves faster . . . smoother . . . safer!

Magliner Dock Boards *safely* speed loading operations and save valuable man hours. It will pay you to investigate how the *right* dock board (a Magliner) will step up dock handling efficiency in your operation. Write today for your copy of DB-204.

with a

Magliner Dock Board

you can show management Big Savings!

Safety factors in both design and construction fully meet your equipment and load requirements . . and provide positive insurance of safe, dependable, and economical long-life service.

Magliners are engineered to meet unusual and out-of-the-ordinary conditions. In this instance, the problem of cramped quarters and limited turning areas was solved with this wide, flared Magliner Dock Board. Most of the turn can be made on the board itself.

COMPARE THESE *Magliner* ADVANTAGES

1. TIRE-SAVER SAFETY CURBS—prevent truck run-offs and stop power truck tire damage. An exclusive Magliner feature.*

2. TRIPLE STRENGTH CURB ENDS—of special alloy, high strength magnesium . . . double tapered for wide angle turns. An exclusive Magliner feature.*

3. RUGGED AND PERMANENTLY ATTACHED UNDERSTRUCTURE fits snugly between dock and carrier to provide positive and automatic positioning—dock board cannot slip out of place!

4. CROWNED, so that the edges bear snugly against the dock and carrier to accommodate varying differences in height—for smooth, safe equipment crossover!

5. MAGNESIUM LIGHT—STRONG—SAFE! Made of the world's lightest structural metal . . . for easy one-man handling, maximum safety, and reliable service.

6. ADDED STRENGTH THROUGH STRESS RELIEVING—an extra safety advantage that can't be seen, but it's important.

7. BEVELED EDGES (maximum 10° slope) facilitate movement of valuable loads on and off the dock board—avoid hazardous load jar—eliminate equipment damage and load loss!

8. COMFORTABLE, ROOMY HAND GRIPS—sealed to exclude moisture. Optional full length hand rails for added safety and convenience.

9. SPECIALLY DESIGNED, FLUSH-TYPE LIFTING HOOKS to facilitate moving the dock board by power truck. (Offered as optional equipment.)

10. POSITIVE, ADJUSTABLE DROP LOCK—the *only* good solution for many ramp and dock board installations. Another exclusive Magliner feature.**

Write Today for Your Copy of Bulletin DB-204

*Pat. Pend. **Pat. No. 2659914

Magliner MAGNESIUM

DOCK BOARDS

MAGLINE INC. • P. O. BOX 23 • PINCONNING, MICHIGAN

Canadian Factory: Magline of Canada, Limited, Renfrew, Ontario

Circle No. 134 on Reader Service Card for more information

REDUCE "Down Time" and Costs with Job-Fitted Goodyear Industrial Tires

You get the right tire for the job when you choose Goodyears – America's most complete line of Industrial Tires.

And you can be sure of better mileage with lower down time and costs because these tires are job-fitted by size, tread design and rubber compound.

So start getting better tire savings in your plant—call your Goodyear Dealer today.

FREE Technical Engineering Advice and Service

To help you solve tough industrial tire problems, Goodyear maintains a staff of fully qualified technical experts. For their free recommendations, write Goodyear, Industrial Tire Division, Akron 16, Ohio.

ALL-SERVICE TREAD XTRA CUSHION

SMOOTH SOLID

ALL-WEATHER TREAD

RIB ALL-WEATHER PNEUMATIC (TUBELESS OR CONVENTIONAL)

SEMI-PNEUMATIC CUSHION

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